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AN INTERPRETATION AND EVALUATION OF TUBAL PATENCY TESTS

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There are today two widely accepted methods of determining tubal patency, uterotubal insufflation and uterosalpingography. Rubin [1] first performed uterotubal insufflation in 1919, using oxygen gas. Salpingography began a few years earlier, when Cary [2] and Rubin [3] in this country carried on independent studies in an attempt to visualize the tubes radiographically. Rindfleisch [4] had previously attempted visualization of the uterine cavity in 1910. Since their inception almost a quarter century ago both tests have been discussed in the literature and there is no need to repeat their historical development here. Their widespread use and almost universal acceptance offer ample testimony to the fact that both have emerged from the chrysalis stage. Both have come to occupy an important place in the study of female sterility. Since equipment and steps in technic have also been thoroughly described, there is likewise little reason for their recapitulation here. On the other hand, a crystallization of important points gleaned from an extensive literature and a personal experience dating back to 1921, covering hundreds of tubal insufflations and over 400 cases of uterosalpingography may be appropriate in this symposium. Both uterosalpingography and uterotubal insufflation are commonly used for determination of tubal patency and for the two the contraindications are the same. While these have been listed many times they are so important that I shall repeat them here.

CONTRAINDICATIONS TO PERFORMING TUBAL PATENCY TESTS

The most important contraindication to the performance of a tubal patency test is the presence of genital tract infection. Most morbidity following tube testing results from failure to recognize or discover cervicitis or incompletely subsided salpingitis. Since careful and satisfactory evaluation of genital infection is not always possible at the time of the initial call, it is seldom wise to determine tubal patency at the time of the first visit. By deferring the test the physician not only obtains more time for the study of his patient but may also schedule the test at a selected time during the menstrual cycle.

Pregnancy is an obvious contraindication. Knowledge of the patient's menstrual history and repeat pelvic examination just prior to tube testing is important.

When uterotubal insufflation is contemplated, air should not be used. While it has been employed extensively it must not be forgotten that most deaths reported following uterotubal insufflation were the result of air embolism.

Determination of tubal patency may be carried out at any time during the cycle, but most investigators prefer the week after menstruation. Time and experience have shown that if living endometrial cells are forced through the tubes they seldom survive, and furthermore pertubation appears to be more satisfactory when the endometrium is in a stage of minimal development and the tube quiescent. General constitutional disease and/or pelvic neoplasia associated with abnormal bleeding are other contraindications.

My interest in tubal insufflation began following Rubin's [1] original report on "The Nonoperative Determination of Patency of Fallopian Tubes" in 1920, at which time it was my privilege to be associated with Dr. Reuben Peterson, whose enthusiasm for pneumoperitoneum was well known. Significant improvements in apparatus such as the recording kymograph, introduced by Rubin in 1925 and modified by him in 1939, plus a variety of cannulas, represent the principal mechanical changes in the growth and development of uterotubal insufflation. As an aid in running down the causes of sterility in women the test remains indispensable. In the average nonfertile union, when the husband has been eliminated as a likely cause, an adequate history taken and such other preliminary studies as physical examination made, then uterotubal insufflation, under proper indications, becomes a logical and necessary procedure. According to reports approximately 60 per cent of women so studied present unequivocal evidence of tubal patency. About 30 per cent are found to have closed tubes.

Since the determination of tubal patency or nonpatency is the primary air of insufflation, the addition of a kymograph which permits recording of both gas pressure and tubal behavior may seem an unnecessary appurtenance. From a practical standpoint this addition has been more than compensated for by the minimum equipment and simplified apparatus also available for tube testing. Certainly, uterotubal insufflation may be accomplished without elaborate equipment. But, regardless of technic used, determination of tubal patency depends on evaluation of the following points:

1. Behavior of manometric pressure.
2. Careful evaluation of subjective symptoms such as pain in the lower quadrants (tube areas).
3. Auscultation (of the tubes) over the lower abdomen.
4. Checking for the presence of shoulder pain (subdiaphragmatic pneumoperitoneum) following the introduction of approximately 300 cc. of gas (patient sitting up).

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Read before the Conference on Sterility sponsored by the National Committee on Maternal Health Inc., New York, Jan. 27, 1945.

1. Rubin, I. C.: The Nonoperative Determination of Patency of Fallopian Tubes by Means of Intrauterine Inflation with Oxygen and the Production of an Artificial Pneumoperitoneum, J. A. M. A. **75**: 661 (Sept. 4) 1920.
2. Cary, W. H.: Am. J. Obst. **69**: 462, 1914.
3. Rubin, I. C.: Surg., Gynec. & Obst. **20**: 435, 1915.
4. Rindfleisch, W.: Berl. klin. Wchnschr. **47**: 780, 1910.

5. Noting the kymographic recording of intratubal pressure and activity.

6. When uterosalpingography is used the fluoroscopic observance of spill from the tubal ostiums or roentgenographic visualization of free oil in the peritoneal cavity following injection of an opaque medium.

Pressure observations are important. Perhaps it does not matter whether this is read directly on a manometer or indirectly as when a recording kymograph is used, so long as pressure determinations are noted. Failure to observe pressure may lead to serious trouble. With a constant and not too rapid flow of gas (approximately 60 cc. per minute) the pressure normally rises to about 120 mm. of mercury and then drops to between 40 and 60 mm., where it tends to remain for the remainder of the test. Progressive and persistent rise in pressure may mean nonpatency. This may be apparent or real. It may be due to spasm of the sphincters sometimes noted in highly irritable tubes, especially at the time of ovulation, to a valvelike effect caused by a thick, velvety, premenstrual endometrium or to an actual organic obstruction. Many physicans failing to use care in the interpretation of pressure changes have diagnosed tubal closure and given a poor prognosis for conception, only to swallow their words when the happy and forgiving patient reports for antepartum care. Gas pressure writes its own story when recorded on a kymograph, and its interpretation along with minor fluctuation due to tubal peristalsis permits informative interpretation regarding tubal physiology.

Uterotubal insufflation without a constant source and flow of gas or benefit of manometric check on pressure as described in simplified technics is not recommended. Since air is commonly used in these abbreviated methods, there is danger of embolism as well as increased opportunity for faulty interpretation of findings.

The patient's subjective complaints during tube testing are likely to be informative, thus:

1. Bilateral lower quadrant pain with steady progressive rise in pressure usually means bilateral closure of the tubes at the fimbriae.

2. Bilateral pain with high but steady pressure (below 180 mm. of mercury) usually means bilateral narrowing of the tubal lumens at the fimbriae.

3. Unilateral pain with slightly elevated pressure means unilateral closure at the fimbria on the painful side.

4. Midline pain with steadily rising pressure means bilateral closure (or spasm) at the corneal ends of the tubes.

The interpretation of subjective symptoms should not be clouded by irregular or too rapid introduction of gas.

Auscultation of the tubes over the lower part of the abdomen was first suggested by Henderson and Amos.[5] The gas percolating from the ends of the tubes may be heard as a low pitched souffle. A high pitched note generally implies a small opening or excessive pressure. One cannot always identify the open tube by this means, since the tubal fimbriae may lie close together behind the uterus. Deception may occur as a result of gas bubbling through a hydrosalpinx or more frequently from a leak around the cannula in the cervix. The Colvin screw-type cannula minimizes leakage and does away with the need for tenacula on the cervix but has the disadvantage of not permitting escape of gas under excessive pressure.

Shoulder pain coming on when the patient sits up immediately after insufflation is one of the standard confirmatory tests for tubal patency. It is due to subdiaphragmatic pneumoperitoneum and may affect either shoulder. The introduction of approximately 300 cc. of gas is necessary to produce this discomfort.

Kymographic recordings of gas pressure and tubal behavior are helpful and probably should be part of modern tubal insufflation equipment. The records so obtained may be interpreted quickly and form a permanent part of the patient's study. For details of tube graph evaluation reference should be made to basic contributions on this subject by Rubin,[6] Wimpfheimer[7] and Feresten[8] and others.

INTERPRETATION OF TUBAL INSUFFLATION

I have already mentioned the criteria by which a diagnosis of tubal patency may be made following insufflation. When these criteria are present it is safe to assume that at least one tube is open. In the absence of such criteria it is to be presumed that the tubes are closed. While this presumption will generally prove correct, it is well to remember that closure may not be permanent and consequently a discouraging prognosis should not be given until closure has been confirmed by repeated testing on several different occasions.

In general, tubal insufflation is the procedure of choice for initial investigation of patency. When stenosis or complete closure has been diagnosed, a further check by means of uterosalpingography may be desirable, since it permits more accurate localization of the obstruction and allows better selection of cases for salpingostomy.

UTEROSALPINGOGRAPHY

At the University of Michigan Hospital during the past decade we have performed uterosalpingography over four hundred times. Approximately 300 were sterility patients; the remainder were checks on tube continuity following ligation or resection.

While the technic for tube visualization is well known, it may be well to emphasize those points which have an important bearing on maintaining this test as a highly successful and safe procedure.

The contraindications are identical with those already listed for uterotubal insufflation, genital tract infection being the most important stop sign.

As with gas insufflation, excessive pressure must be avoided. For highly informative thoroughly safe results all oil injections should be carried out under fluoroscopic control, taking care to use warm opaque mediums and only enough (6 to 10 cc.) to maintain adequate filling of the uterine cavity. The opaque medium used is a matter of considerable importance and should meet the following requirements:

1. It should give good contrast on roentgen visualization.

2. It must have sufficient consistency to permit ample time for study, including follow-up roentgenograms.

3. It should be neither too rapidly nor too slowly absorbed.

4. It must not cause irritation of mucous membranes or peritoneum.

5. It must be safe to use.

While none of the opaque mediums available appear to fulfil all these requirements satisfactorily there is every reason to believe that one will be found. Indeed, when an ideal medium becomes available we may also find that it contains many remedial and therapeutic

5. Henderson, H., and Amos, T. G.: Sterility Studies: Preliminary Report, J. A. M. A. **78**: 1791 (June 10) 1922.

6. Rubin, I. C.: Am. J. Obst. & Gynec. **14**: 557, 1927.

7. Wimpfheimer, S., and Feresten, M.: Am. J. Obst. & Gynec. **37**: 405, 1939.

8. Feresten, M., and Wimpfheimer, S.: Endocrinology **24**: 510, 1939.

properties now merely foreshadowed by existing preparations. In our hands lipiodol has proved quite satisfactory, although its slow absorption and possible irritant qualities are undesirable features. Rubin [9] prefers visco-rayopake, while Titus, Tafel, McClellan and Messer [10] recommend skiodan-acacia.

All patients in our study represent a cooperative effort in that the fluoroscopic examination is under the direct control and visualization of both roentgenologist and gynecologist. Much valuable data are obtained in this way. The filling of the uterine cavity and the slow passage of oil out into the tubal lumens may be observed directly. Leakage from the tubal ostiums into the peritoneal cavity or around the cannula in the cervix may be noted and controlled. Since direct injection in the darkened fluoroscopic room does not permit ready pressure observation, the tension may be regulated by visualizing the filling of the uterine cavity and by noting the patient's subjective symptoms. A manometer with luminous gradations would permit accurate pressure recordings and a higher margin of safety. Evidence of tubal patency may be obtained at this time by seeing droplets of oil disappear from the outer ostiums of the tube. This should be confirmed by roentgenograms taken following the fluoroscopic study. Since roentgenograms serve as a permanent record of findings, they should be obtained in every instance. In cases of doubtful patency or nonpatency, a twenty-four or forty-eight hour checkup roentgenogram is essential. These follow-up plates are highly important. They either confirm the nonpatency or else reveal definite but late escape of oil through the tubal ostiums. Failure to take advantage of fluoroscopic examination and control at the time of injection and of roentgenographic follow-up studies some hours after injection doubtless accounts for some of the complications as well as faulty interpretations attributed to uterosalpingography. The presence of oil in the peritoneal cavity is proof of tubal patency.

INTERPRETATION OF UTEROSALPINGOGRAPHY

When tube status remains in doubt following insufflation or when salpingostomy is contemplated for tubal obstruction, salpingography comes into its own. For these cases it reigns supreme as a diagnostic test. In my opinion the localization of tubal obstruction permitted by uterosalpingography is far superior to any evidence made available through insufflation alone. This means that in approximately one third of women studied for sterility uterosalpingography serves as a useful and important diagnostic and prognostic aid. While fluoroscopic and roentgenographic findings during and after iodized oil injection are not difficult to read, their interpretation demands care. Final decision regarding nonpatency should not be based on fluoroscopic findings alone. A twenty-four or forty-eight hour checkup roentgenogram may show definite spill of oil into the peritoneal cavity—evidence that obstruction has at least in part been overcome. Spasm, when present, may vary in degree on the two sides; consequently the true status of both tubes may not always be clear at the time of injection. However, temporary occlusion is less likely to be misinterpreted with salpingography than with insufflation, since the follow-up roentgenogram showing oil in the peritoneal cavity tends to disprove the first gained impression of nonpatency.

9. Rubin, I. C.: J. Mount Sinai Hosp. **7**: 479, 1941.
10. Titus, P.; Tafel, R. E.; McClellan, R. H., and Messer, F. C.: Am. J. Obst. & Gynec. **33**: 164, 1937.

MORBIDITY AND MORTALITY

Important in the evaluation of any test is the risk to the patient. We have no way of knowing how many deaths and to what extent febrile morbidity has occurred following the use of these tests. Certainly it is improbable that reported cases represent the whole story. On the basis of data available, it appears that less than 1 patient in a thousand suffers any morbidity following uterotubal insufflation. Morbidity following uterosalpingography is higher. Most trouble appears to have resulted from failure to rule out genital tract infection.

Injection of oil into the uterine and ovarian veins during salpingography has been reported many times. The symptoms associated with this complication do not appear to be severe and according to Green-Armytage [11] consist of little more than transient nausea and vomiting. Actual visualization of oil in the pelvic veins following salpingography should not blind us to the fact that this accident probably occurs quite as often during uterotubal insufflation. Since air embolism may be a serious matter, it is well to emphasize again the desirability of using the more soluble carbon dioxide for tubal insufflation.

The mortality rate must be extremely low and in gas pertubation was caused chiefly by air embolism. At least 6 cases have been reported, to wit:

1. Moench.[12] Gas inflation, tubes closed, death. Autopsy revealed gas in the heart chambers. Gas embolism diagnosed as cause of death.
2. Moench.[12] Oxygen insufflation, tubes patent at 200 mm. of mercury, death. Autopsy revealed gas in the heart, veins and abdomen, perforated small intestine and a question of perforation of the uterus.
3. Dibble, Hewer, Roes and Walsh.[13] Tubal insufflation pressure at 150 to 200, sudden death. Autopsy revealed air embolism.
4. Mansfield and Dubits.[14] Gas insufflation, death. Autopsy revealed tuberculous endometritis and air embolism.
5. Weitzman.[15] Insufflation, convulsion and death. Autopsy revealed air embolism.
6. Feiner.[16] Woman aged 26; insufflation with oxygen pressure at 160 mm. of mercury. Death within one-half hour. Diagnosis, rupture of coronary vein, hemipericardium, pulmonary thrombosis and chronic myocarditis.

I have been unable to discover any recorded fatality following the use of carbon dioxide. At least nine deaths have been reported following uterosalpingography. Most of these deaths are reported in European literature and I have not been able to run down the original articles to permit a check on the actual cause of the fatality. Deaths following uterosalpingography follow. This may not represent a complete list and obviously does not include unrecorded cases:

1. Gauss.[17] Five deaths in 3,000 collected cases.
2. Schultze.[18] Three deaths in 8,000 collected cases.
3. Feiner.[16] One death. Patient died fourteen days following lipiodol injection, of widespread generalized peritonitis.

Most fatalities following the use of either air or oil occurred in the earlier years when the patency tests were in their developmental stage.

11. Green-Armytage, V. B.: J. Obst. & Gynec. Brit. Emp. **50**: 23, 1943.
12. Moench, G. L.: Two Cases in Which Death Followed Insufflation of the Fallopian Tubes, J. A. M. A. **89**: 522 (Aug. 13) 1927.
13. Dibble, J. H.; Hewer, T. S.; Roes, A. O. F., and Walsh, C. H.: Lancet **1**: 313, 1938.
14. Mansfield, O. P., and Dubits, A.: Zentralbl. f. Gynäk. **58**: 211, 1934.
15. Weitzman, C. C.: New York State J. Med. **27**: 1582, 1937.
16. Feiner, David: Am. J. Obst. & Gynec. **43**: 639, 1942.
17. Gauss, C. J.: Zentralbl. f. Gynäk. **51**: 1824, 1927.
18. Schultze, G. K. F.: Ztschr. f. Geburtsh. u. Gynäk. **101**: 413, 1931.

EVALUATION OF TUBAL PATENCY TESTS

In the past, uterotubal insufflation and uterosalpingography have been looked on as competitive tests, and this they doubtless are, for both are methods of determining tubal patency. Now that both have been thoroughly tested and proved, it is proper that they be looked on as complementary procedures, one supplementing the other. As the initial step in determining tubal patency, insufflation is to be preferred. In the majority of cases this test alone will give all needed information. For doubtful cases and in cases presenting definite evidence of nonpatency I prefer uterosalpingography with its visual proof of tube status and opportunity for better evaluation when salpingostomy is considered. Iodized oil injection may exert a therapeutic effect on the closed viscus. Repeated iodized oil injection may be expected to result in reopening a few closed tubes. Just how often this will occur must depend in large measure on the severity of the obstruction as well as on the number of reinjections carried out. No accurate statistics can be given on this point. A comparison of the tests from the standpoint of diagnostic value would doubtless precipitate many arguments both for and against each method. Such comparisons as have been carried out in the past have served to emphasize the importance of interpretation. The fact that one test shows nonpatency whereas patency is proved by the other test a few days later does not indicate superiority of one method over the other as a means of determining tubal continuity. The situation could easily have been reversed and is readily explained on the basis of tube spasm or other transitory interference with patency. Both tests are useful, and while either will permit evaluation of tubal patency they each have a particular field of usefulness in the study of sterility and of tubal physiology. For the determination of patency alone insufflation with carbon dioxide is given first choice, but this test is useless as a means of visualizing the tubes and it is here that the salpingogram dominates the field. It is in this manner that the tests supplement each other.

I consider uterosalpingography an essential preliminary to contemplated salpingostomy. Furthermore, such operative procedure on the tubes should not be carried out until several checks for tubal patency have been made, since it is well known that spontaneous restoration of tubal continuity occasionally takes place.

There can be no doubting the fact that both tests have a therapeutic as well as a diagnostic value. The fact that pregnancy occurs within a month or two after tubal patency determination is proof of such therapeutic value. Doubtless success is accomplished by mechanical means through the removal of a mucous plug or old blood or the disruption of adhesions which may have been sufficient to interfere with migration of the ovum.

Many writers have attempted statistical evaluation of tubal patency tests. Such mathematical assay is interesting and could be valuable were there some way of obtaining reasonable accuracy. However, the fact that many patients conceive without benefit of medical aid, while others receive local and/or general treatment in addition to tube testing, makes statistical evaluation something little better than a guess. This is especially true when many months have elapsed between the test and the time of conception. Since reported series probably represent a small minority of the total tube testings carried out throughout the world, and these under favorable conditions at that, it is obvious that data on therapeutic benefits as well as on morbidity are grossly inaccurate and incomplete. The most that can be said is that when properly performed the morbidity following tube testing is extremely low. We should not assume too much in the way of remedial benefit from the use of these tests. The occasional resolution of tubal obstruction as a result of repeated iodized oil instillations has been claimed. I have noted a return of patency in some patients following repeated injections. This apparent remedial aspect of uterosalpingography is difficult to evaluate but in time and with improved injection mediums may prove to be a real boon to sterility patients.

Uterotubal insufflation with carbon dioxide gas and uterosalpingography are today the principal two methods of studying tubal patency and physiology in the human being. These tests should not be looked on as competitive procedures, for each has its field of usefulness as well as its limitations. One supplements the other, and both are essential for comprehensive evaluation of the part played by the tubes in sterility of the female. When properly performed with full knowledge of both indications and contraindications, they are safe and highly informative.

THE INCIDENCE OF DIABETES MELLITUS AND GLYCOSURIA IN INDUCTEES

WITH NOTES ON SOME PROBLEMS IN DIAGNOSIS

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The statistical observations in this paper were stimulated by the editorial [1] appearing in THE JOURNAL on April 8, 1944. The high incidence of diabetes mellitus found by Blotner and his co-workers [2] in urban New England warranted a study in another part of the country where other economic, social and racial factors are at work.

This survey is based on 32,033 consecutive selectees processed at the New Orleans Induction Station. Although the number of examinees in our series is only about one third less than in the survey reported by Blotner,[2] the number of men with diabetes in our group is much smaller. In our group there were only 37 cases of glycosuria, and of these only 9 appeared to be true diabetes mellitus. Thus our group showed a rate of 1.15 per thousand for glycosuria and slightly less than 0.3 per thousand for diabetes.

This is in wide variance with the figures presented by Blotner and his co-workers,[2] who found among their 45,650 selectees 367 cases of glycosuria, or 8 per thousand; and of these more than half, or 208, were cases of diabetes (4.5 per thousand). This, as was pointed out in the editorial,[1] is a high rate in both categories. Our rate for glycosuria of 1.15 per thou-

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1. The Incidence of Diabetes in Selectees, editorial, J. A. M. A. **124:** 1062 (April 8) 1944.

2. Blotner, H.; Hyde, R. W., and Kingsley, L. V.: Studies in Diabetes Mellitus and Transient Glycosuria in Selectees and Volunteers, New England J. Med. **229:** 885, 1943.

sand compares favorably with rates reported by other observers. Sydenstricker and Britten [3] reported that glycosuria in the age group 20 to 24 occurs at the rate of 1.1 per thousand, increasing to 2.2 per thousand in the group 30 to 34. Dublin and his co-workers [4] found that frank glycosuria under 25 years of age occurs at the rate of 1 per thousand, going up to 3 per thousand between 25 and 34 years of age. In a mixed group of insurance applicants reported by Marble [5] the incidence of glycosuria was found to be 2.8 per thousand. However, our diabetic rate of 0.28 per thousand is a good deal lower than the national health survey rate of 0.6 per thousand in the age group 15 to 24 and 0.9 per thousand in the age group 25 to 34.

Although the number of diabetic individuals in our group is small, the group of selectees is sufficiently large to make our statistics of some significance. The question that immediately arises is Why is there so much discrepancy between our findings and those of the New England workers? Our group differs in several respects from the other group. All these differences would tend to diminish the incidence of diabetes.

The two groups differ slightly in age. The selectees we studied were examined in 1944, when very few men over 35 years of age were inducted. Thus our group is practically confined to the age group 18 to 35. The New England studies were reported in 1943 and admittedly included age groups up to 45. That the incidence of diabetes increases rapidly with increasing age is well established. Thus, Joslin, Dublin and Marks [6] found that diabetes is nearly three times more common in the age group 40 to 45 than it is in the younger group of 20 to 39. Sydenstricker and Britten [3] also noted a tripling of incidence in the older group of 40 to 45 as compared with the younger group of 25 to 29.

The incidence of diabetes varies widely in its geographic distribution. The lowest rate in the United States is found in the rural South and the highest in the urban and highly industrialized Eastern seaboard and New England states. Joslin and his co-workers [6] found that the mortality from diabetes in the white population of Rhode Island was 26.9 per hundred thousand and of New York 26.7 per hundred thousand, while in Louisiana the mortality was only 13.2 per hundred thousand and in Arkansas 8.3 per hundred thousand. Himsworth [7] also points out that the diabetic death rate is twice as high in the North as it is in the South and ascribes this to the difference in diet.

Race is also an important factor in the incidence of diabetes. It is less common among Negroes both in the North and in the South as compared with the white population in these regions. Its incidence is lower in the Southern than in the Northern Negro.[8] One third of our group of selectees were Negroes and hence would contribute to the lowering of the incidence of this disease in our group.

Recent publications suggest that diabetes is an uncommon factor for rejection for military service. Rowntree,[9] reporting on the estimated causes for rejection of selectees in the age group 18 to 37, does not mention diabetes in his statistics. Diabetes is probably included under the heading of "Endocrine Disorders," which is responsible for 1 per cent of rejections, or under the heading of "Other Medical Defects," with a rejection rate of 0.6 per cent. Likewise, in the report by Gallagher and Brouha [10] diabetes is not mentioned in the enumeration of various causes for rejection.

Another and perhaps very important cause for variation of the different statistics dealing with the incidence of diabetes depends on the criteria of diagnosis. In the diagnosis of the mild and previously undetected disease, which is usually unaccompanied by symptoms, the glucose tolerance test may be the sole criterion. There are several methods of performing this test. The boundary line between the normal and the abnormal curve is not sharp, varies with different authorities and at best is beset by many pitfalls. Finally, even a definitely abnormal and diabetic-like curve may not be due to diabetes.

In the most commonly used test, in which 100 Gm. of glucose is administered orally, the "normal" individual shows a maximum rise of the blood sugar to between 170 and 180 mg. per hundred cubic centimeters and at two hours a return to the fasting level.[11] The fasting blood sugar should be between 80 and 120 mg. per hundred cubic centimeters of blood. Joslin [11] places the greatest emphasis on the rise of the blood sugar, stating that a value of over 170 mg. per hundred cubic centimeters ordinarily justifies a diagnosis of diabetes. Marble [11] adds that a return to the fasting level in two hours is an important criterion. But what if the fasting level is 70 to 80 mg. per hundred cubic centimeters and a two hour value is 10 to 15 mg. above this? Are we justified in calling such a curve diabetic or even pathologic? John [12] relaxes the latter criterion somewhat by assuming that a return of blood sugar to 120 mg. per hundred cubic centimeters of blood or lower in two and one-half hours can be considered within limits.

No clinical test can be interpreted too strictly and specific diagnostic implications made therefrom. A glucose tolerance curve is no exception. Many pathologic and physiologic states can have a profound influence on blood sugar and carbohydrate tolerance. Differences in the rate of intestinal absorption will have an influence on the oral glucose tolerance test. Malfunction of other endocrine glands (besides the pancreas) and the liver [13] can produce diabetic-like glucose tolerance curves. Obesity may be accompanied by disturbed carbohydrate tolerance.[14] The influence of emotions [15] and previous diet [16] on the glucose tolerance curve are well known.

3. Sydenstricker, Edgar, and Britten, R. H.: Physical Impairments of Adult Life: Prevalence at Different Ages, Based on Medical Examinations by the Life Extension Institute of 100,924 White Male Life Insurance Policyholders Since 1921, Am. J. Hyg. **11**: 95, 1930, cited in editorial.[1]

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7. Himsworth, H. P.: Diet and the Incidence of Diabetes Mellitus, Clin. Sc. **2**: 117, 1935.

8. Joslin, Dublin and Marks.[6] Himsworth.[7]

9. Rowntree, L. G.: National Program for Physical Fitness, J. A. M. A. **125**: 821 (July 22) 1944.

10. Gallagher, J. R., and Brouha, L.: Physical Fitness, J. A. M. A. **125**: 834 (July 22) 1944.

11. Joslin, E. P.; Root, H. C.; White, Priscilla, and Marble, Alexander: The Treatment of Diabetes Mellitus, ed. 7, Philadelphia, Lea & Febiger, 1940. Marble, Alexander: Renal Glycosuria, Am. J. M. Sc. **183**: 811, 1932. Bodansky.[15]

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14. Newburgh, L. H., and Conn, J. W.: A New Interpretation of Hyperglycemia in Obese Middle Aged Persons, J. A. M. A. **112**: 7 (Jan. 7) 1939.

15. Bodansky, Meyer, and Bodansky, Oscar: Biochemistry of Disease, ed. 2, New York, Macmillan Company.

16. Sweeney, J. S.: Dietary Factors That Influence the Dextrose Tolerance Test, Arch. Int. Med. **40**: 818 (Dec.) 1927. Himsworth, H. P.: Dietetic Factors Influencing the Glucose Tolerance and the Activity of Insulin, J. Physiol. **81**: 29, 1924.

Antecedent diet is probably the commonest disturbing factor. Since dietary histories are notoriously unreliable, it has been recommended to place the candidate on a high carbohydrate diet before the tolerance test is performed. This is quite unpractical, especially when larger groups of individuals are studied, as in military practice. The "Exton-Rose" test,[17] in which two 50 Gm. doses of glucose are administered at half hour intervals, was supposed to obviate this difficulty. The first dose presumably primed the carbohydrate regulating mechanism so that the second dose of glucose produced a drop or only a slight rise in the blood sugar. Thus, according to the early standards laid down by Exton and Rose,[17] a normal curve should include (1) normal fasting blood sugar, (2) one-half hour after the first dose of glucose a rise in blood sugar not to exceed 75 mg. per hundred cubic centimeters of blood, and (3) one-half hour after the second dose of glucose a rise in blood sugar not to exceed 5 mg. per hundred cubic centimeters of blood. Wayburn and Gray[18] agreed that this test obviates the influence of previous diets on the glucose tolerance curve but used a two hour determination to distinguish the severe cases of disturbed carbohydrate metabolism.

TABLE 1.—*Normal Exton-Rose Tests*

Case	Fasting Blood Sugar	½ Hour	1 Hour
1	81	129	138
2	80	108	86
3	105	128	133
4	98	163	169
5	90	117	105
6	83	133	115
7	80	121	87
8	83	123	138
9	93	128	134
10	93	111	97
11	95	125	115
12	78	141	116
13	96	122	127
14	86	111	102
15	99	133	89
16	110	170	132
17	99	120	115
18	85	105	125
19	105	146	125

Many observers, however, disagree with the conception that prevous diet had no influence on the "Exton-Rose" curve and also the standard of normality set down by Exton and Rose.[17] Thus, Sweeney and his co-workers[19] as well as Langner and his co-workers[20] concluded that a high fat diet would distort the Exton-Rose curve to the diabetic side. The latter workers[20] also considered a blood sugar of over 140 either at the half-hour or one hour period as abnormal. Langner and Dewees[21] concluded that the original interpretation as set down by Exton and Rose[17] is too rigid and would label many normal individuals diabetic. They agreed with Matthews and his co-workers[22] that the emphasis on the rise between the first and the second dose of glucose is not justified and that if the one hour value does not exceed 160 mg. per hundred cubic centimeters of blood the response should be considered normal. If this value is 160 to 180 mg. of sugar per hundred cubic centimeters of blood it should be called borderline, but if over 180 it should be considered as definitely diabetic. Gould and his co-workers[23] allow for a total rise of less than 80 mg. of glucose per hundred cubic centimeters of blood but contend that in a normal individual the one-half hour rise should be under 50 mg. and the one hour rise under 30 mg. per hundred cubic centimeters of blood. Thus it can be readily seen that the criteria of normality vary widely with this test.

We used the "Exton-Rose" test first on all our patients. This procedure has technical advantages which are helpful in surveys of large numbers of patients, since only three blood sugar determinations are required and the test lasts only one hour. If the rigid criteria of Exton and Rose are applied, perhaps with slight modifications, all diabetic persons are immediately ruled out by a normal response. Nineteen of our 37 cases (table 1) studied for glycosuria gave a normal Exton-Rose response. Fasting blood sugars varied between 80 and 110 mg. per hundred cubic centimeters of blood and all except three had a blood sugar below 100. The greatest rise of blood sugar after the first dose of dextrose was 65 mg. per hundred cubic centimeters of blood. The blood sugar after the second dose of glucose showed a fall in 12 of the 19 cases. The other 7 showed a rise of 5 to 20 mg. of dextrose per hundred cubic centimeters of blood. One 15 and one 20 mg. rise were included in this normal group, although it is above the maximum rise permitted by Exton and Rose, because these occurred in persons with essentially low blood sugar values. The 20 mg. rise (case 18, table 1), which was from 105 to 125 mg., was the highest, and the 15 mg. rise (case 8, table 1), in which the highest blood sugar value was 138 mg. per hundred cubic centimeters of blood.

TABLE 2.—*Abnormal Exton-Rose and Normal Three Hour Glucose Tolerance Tests*

	Abnormal Exton-Rose Tests, Blood Sugar per 100 Cc. of Blood			Normal Three Hour Glucose Tolerance Tests, Blood Sugar per 100 Cc. of Blood				
Case	Fasting	½ Hour	1 Hour	Fasting	½ Hour	1 Hour	2 Hours	3 Hours
1	101	123	154	95	117	111	90	80
2	94	140	167	83	129	125	81	80
3	86	125	142	80	100	133	105	76
4	93	110	148	88	114	101	92	80
5	72	121	140	80	120	95	92	77
6	100	183	145	102	180	133	91	68
7	112	210	182					
	101	139	152	106	110	111	108	80
8	91	212	160	96	133	167	98	83
9	106	215	235	102	174	143	76	74
10	92	144	222	100	166	160	111	66

When the Exton-Rose curve gave "abnormal" values another glucose tolerance test was done the following day, using 100 Gm. of glucose in one dose and doing blood sugar determinations for three hours. Ten of our group of glycosurias gave abnormal Exton-Rose curves followed by a normal three hour glucose tolerance curve

17. Exton, W. G., and Rose, A.: The One Hour Two Dose Glucose Tolerance Test, Am. J. Clin. Path. **4**: 381, 1934.
18. Wayburn, E., and Gray, Horace: The Two Dose Glucose Tolerance Test, Am. J. M. Sc. **204**: 823, 1942.
19. Sweeney, J. S.; Muirhead, J. J., and Allday, L. E.: Observations on the One Hour Two Dose Dextrose Tolerance Test, Am. J. Clin. Path. **7**: 482,1937.
20. Langner, P. H., and Fies, H. L.: The Influence of Antecedent Diet on the Exton-Rose One Hour Two Dose Glucose Tolerance Test, Am. J. Clin. Path. **11**: 41, 1941.
21. Langner, P. H., and Dewees, E. J.: Instances of Disagreement in the Results of Two Types of Oral Glucose Tolerance Tests, Am. J. M. Sc. **204**: 85, 1942.
22. Matthews, M. W.; Magath, T. B., and Berkson, J.: The One Hour Two Dose Dextrose Tolerance Test, J. A. M. A. **113**: 1531 (Oct. 21) 1939.
23. Gould, S. E.: Altshuler, S. S., and Mellen, H. S.: The One Hour Two Dose Glucose Tolerance Test in the Diagnosis of Diabetes Mellitus, Am. J. M. Sc. **193**: 611, 1937.

(table 2). The first five of these ten Exton-Rose curves would have been considered normal by the more liberal interpretation of this test.[24] This again shows that the criteria of Exton and Rose would label some normal persons diabetic. The last five "Exton-Rose" tests (table 2) are definitely abnormal by all criteria,

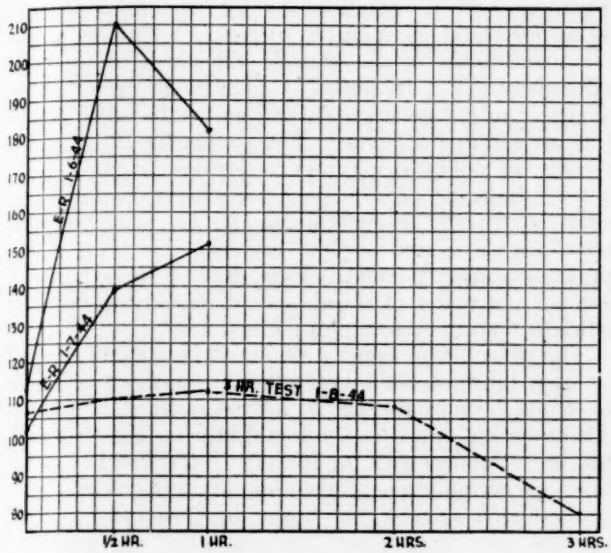

Chart 1.—Exton-Rose and three hour tests in case 7, table 2.

and if we had stopped here a diagnosis of diabetes would have been made in these cases. The three hour glucose tolerance tests, however, done the following day were normal in all these cases. The maximum height of the blood sugar in these three hour curves was 180 mg. per hundred cubic centimeters of blood occurring only in 1 case. A level of 174 mg. per hundred cubic centimeters of blood was recorded in another case. The rest showed all values below 170 mg. The blood sugar returned to a normal fasting level in two hours and in most was below the control value of that individual.

The change of the glucose tolerance curve from one day to the next was quite remarkable. Case 7, table 2, is especially noteworthy. The first Exton-Rose curve showed a fairly high normal fasting blood sugar of 112 mg. of dextrose per hundred cubic centimeters of blood, followed by a rise of nearly 100 mg. after the first dose of glucose. Although a fall of blood sugar occurred after the second dose of glucose, this value was still over 180 mg. The next day the fasting blood sugar was lower; the first rise was only 38 mg. per hundred cubic centimeters of blood. After the second dose of glucose there was a rise of only 13 mg., so although according to the standards of Exton and Rose [17] this is still an abnormal response, according to all the other interpretations [25] this is to be considered normal. On the third day a three hour test yielded a flat curve with a fall of blood sugar at three hours to a level 26 mg. below fasting (chart 1). Another case worth mentioning is case 10, table 2 (chart 2). The Exton-Rose curve again is abnormal according to all criteria, with the one hour value being 222 mg. of glucose per hundred cubic centimeters of blood. The three hour test the following day was normal in all respects, the maximum rise being to 166 mg. of sugar per hundred cubic centimeters of blood with a return to normal fasting level at the end of two hours and only 66 mg. at three hours.

The 9 patients with diabetes (table 3) showed completely abnormal glucose tolerance tests both by the Exton-Rose curve and by the three hour test. The fasting blood sugar was above 120 mg. per hundred cubic centimeters in only 2 individuals. The one hour value in the Exton-Rose curve was higher than the

TABLE 3.—*Glucose Tolerance Tests in Diabetic Patients*

	Exton-Rose			Three Hour Test				
Case	Fasting	½ Hour	1 Hour	Fasting	½ Hour	1 Hour	2 Hours	3 Hours
1	120	206	206	118	200	232	200	98
2	180	266	276					
3	122	216	302	119	232	332	338	208
4	102	144	238	97	209	200	106	80
5	97	192	250	98	195	250	206	88
6	94	222	298	100	215	245	160	130
7	86	125	166	93	122	170	174	108
8	86	105	181	89	160	200	140	67
9	103	154	247	114	216	280	278	190

half-hour value in all but 1 case. In the latter the two values were the same. The one hour value was above 200 in all but 2, and in 4 it was 250 mg. per hundred cubic centimeters of blood or higher. In the three hour test the return of the blood sugar to fasting level was definitely slow. Only 1 case (case 4, table 3) showed a normal value at two hours. In 3 patients the three hour value was above normal. It seems that the rate of return of the blood sugar to a fasting level is a more certain criterion of diabetes than the height of the blood sugar.

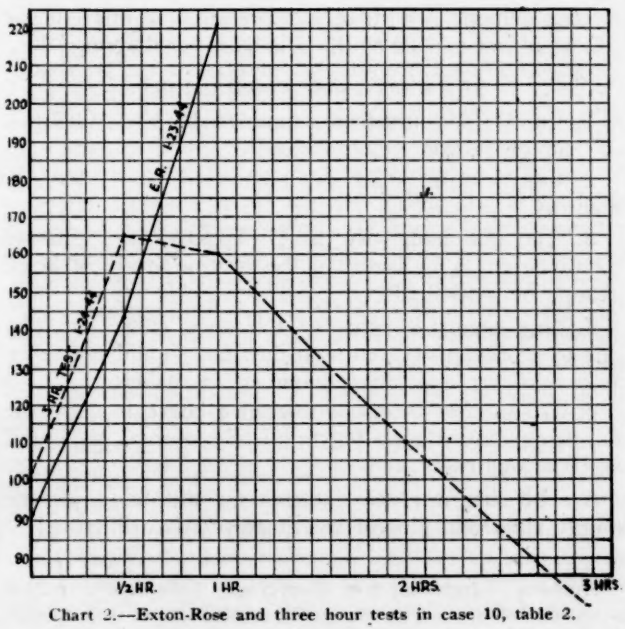

Chart 2.—Exton-Rose and three hour tests in case 10, table 2.

Two cases in this group (table 3) showed borderline curves. Case 7, table 3, had a borderline Exton-Rose curve. The three hour test showed a slow rise in blood sugar and the half hour value was only 122 mg. of glucose per hundred cubic centimeters of blood, but the two hour value was 174 mg. A temporary disturbance of intestinal motility, such as duodenal or pyloric spasm, may have interfered with absorption; hence the slow

24. Langner and Dewees.[21] Matthews, Magath and Berkson.[22]
25. Langner and Dewees.[21] Matthews, Magath and Berkson.[22] Gould, Altshuler and Mellen.[23]

rise in blood sugar and the hyperglycemia at two hours. Case 4 had a grossly abnormal Exton-Rose curve. The only abnormality, however, in the three hour curve was the rise of the blood sugar to 209 mg. per hundred cubic centimeters of blood. The return to a normal value occurred in two hours. A curve of this type could conceivably be due to rapid absorption from the intestine and some delay in glycogenesis by a mildly disturbed liver function.

The phenomenon shown in table 2 of a highly abnormal "Exton-Rose" test followed the next day by a perfectly normal three hour glucose tolerance curve is of great significance. It emphasizes the danger of establishing the diagnosis of diabetes on the basis of a single glucose tolerance curve. Unless the first glucose tolerance test is highly abnormal, that is, one which shows a very great rise of blood sugar (above 250 mg.), failure to return to the fasting level in three hours (three hour curve) and a fasting level above 120 mg., another glucose tolerance curve should be done the following day. The first abnormal glucose tolerance response may be dependent on the fact that the patient subsisted on a high fat diet. The administration of the hundred grams of glucose in the first test stimulates the patient's carbohydrate regulating mechanism and results in a normal glucose tolerance curve the following day. This apparently occurred in our case in table 2. The one hour two dose test may be preferable as the first test because of its technical advantages. If this test is normal it may be safely concluded that diabetes mellitus is ruled out.

Other factors may influence the oral glucose tolerance, such as rate of intestinal absorption and motility. Many factors may disturb carbohydrate metabolism [13] besides true diabetes, and some of these disturbances may be transient. Many nondiabetic persons will be labeled diabetic if a strict interpretation of one glucose tolerance test is used as the sole basis for diagnosis.

SUMMARY AND CONCLUSIONS

1. Of 32,033 inductees examined in New Orleans, 37 had glycosuria.

2. Only 9, or 0.28 per thousand, had diabetes mellitus.

3. The one hour two dose (Exton-Rose) glucose tolerance curve is useful in the routine study of large groups of individuals.

4. One abnormal glucose tolerance curve may be due to a previously abnormal diet and should not serve as a basis for a positive diagnosis of diabetes.

5. If another dextrose tolerance curve is done the following day, it may be completely normal, as found in 10 of our cases.

6. The diagnosis of diabetes on the basis of one mildly abnormal glucose tolerance test is unjustified.

Humane Education for Medicine.—A humane education is an invaluable asset to any youth embarking on the study of medicine. I am aware that I raise the banner of a forsaken cause when I say this; but nevertheless, twenty-five years of clinical teaching have fully persuaded me that, when I find a clinical clerk who can stand up and read at a ward visit a case history that is a well ordered, lucid and fluently expressed account of the patient and his situation, that student will almost invariably be found to have had a sound education and not a mere course of instruction of the polytechnic order, a utility education.—Walshe, F. M. R.: The Integration of Medicine, *Brit. M. J.*, May 26, 1945.

AEROSOL PENICILLIN IN GENERAL PRACTICE

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FOREST HILLS, N. Y.

My object in this presentation is to demonstrate the advantages of the Barach aerosol penicillin method [1] as an effective, inexpensive means of treatment which eliminates some of the present difficulties of penicillin administration. It makes penicillin therapy readily available to the general practitioner in the office and to the patient in the home. The particular value of the technic in upper respiratory infections is emphasized, since a large proportion of conditions for which penicillin is required in general practice are the acute bacterial invasions and chronic bacterial infections of the upper respiratory tract which develop into parasitic states.[2] In many of these cases it appears to be more efficient than the parenteral method.

The preeminent value of parenteral penicillin therapy in many infections and its freedom from severe reactions have now been established by a mass of clinical evidence. The only real disadvantage found in penicillin treatment has been the necessity for frequent intramuscular injections or continuous intravenous administration. It is generally considered that hospitalization and continual medical supervision and nursing care are essential. However, various technics are being tested by means of which adequately bacteriostatic levels of penicillin may be maintained in the body with less frequent injections or by oral administration.[3]

A number of investigators have reported the therapeutic value of the sulfonamides in respiratory infections when administered by inhalation of vaporized solutions. A comparable technic of administering penicillin has been described by Barach,[1] Bryson,[4] and Knott and Clark.[5] These papers, especially that of Barach, should be consulted for a full description of the various steps by which a satisfactory technic for inhaling penicillin solution was developed. The preliminary investigations [6] showed that a highly concentrated penicillin solution could be nebulized and inhaled as a mist without diminishing its potency; Knott and Clark [5] found that

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1. Barach, Alvan L.; Silberstein, Frederick H.; Oppenheimer, Enid T.; Hunter, Thomas, and Soroka, Max: Inhalation of Penicillin Aerosol in Patients with Bronchial Asthma, Chronic Bronchitis, Bronchiectasis and Lung Abscess: Preliminary Report, Ann. Int. Med. **22:** 485 (April) 1945.

2. The symptoms caused by chronic infection with a specific organism are apparently not yet widely recognized, although such parasitic bacterial states may cause a diversity of symptoms in tissues other than the upper respiratory tract. There is need of a definitive term for such chronic infections, one more exact than "focal infection" and one which implies a balance between the resistance factors of the host and the adaptation of the bacterial cells to these resistance factors. Colin MacLeod (personal communication) observed patients in whom specific pneumococcus types persisted for over ten years. From 1 patient in the author's series MacLeod repeatedly cultured pneumococcus types XIII and XIX over a period of six years. Although there were no extrinsic allergies, many allergic symptoms developed which responded dramatically to aerosol penicillin, as they did in other similar cases. R. A. Goodwin Jr., Clare Wilcox and Maxwell Finland (Persistence of Pneumococci in Sulfonamide Treated Cases of Pneumonia, Am. J. M. Sc. **209:** 628, 1945) describe the persistence of pneumococci for shorter periods after sulfonamide therapy. Homer Swift (personal communication) and Norman Plummer, D. R. Duerschner, H. D. Warren, F. T. Rogliano and R. A. Sloan (Penicillin Therapy in Hemolytic Streptococcic Pharyngitis and Tonsillitis, J. A. M. A. **127:** 369 [Feb. 17] 1945) state that persistent infections due to certain Lancefield types of streptococci should be treated before complications develop. In this group of cases several persistent group A streptococcic infections involving the upper respiratory tissues appear to have been eliminated by aerosol penicillin therapy when parenteral penicillin failed.

3. Prolonging the Action of Penicillin, editorial, J. A. M. A. **127:** 161 (Jan. 20) 1945; Oral Penicillin, ibid. **127:** 1129 (April 28) 1945.

4. Bryson, Vernon; Sansome, Eva, and Laskin, Sidney: Aerosolization of Penicillin Solutions, Science **100:** 33 (July 14) 1944.

5. Knott, F. A., and Clark, W. H.: Absorption of Aerosol Penicillin via the Lungs, Lancet **1:** 468 (April 14) 1945.

6. Barach, Silberstein, Oppenheimer, Hunter and Soroka.[1] Bryson, Sansome and Laskin.[4]

penicillin dispersed as an aerosol in a room was fully active for at least ninety minutes. No significant differences could be detected in microscopic lung sections of rats which had been given inhalations of penicillin, neosynephrin, sulfathiazole, sulmefrin, 20 per cent potassium iodide solution and 2.5 per cent sulfadiazine in ethanolamine solution, as compared with those given saline inhalations or no treatment.[1] Thus, the deposition of penicillin in the lung tissues by aerosolization is apparently safe.

Inhalation of sodium penicillin by nearly all patients was carried out without by-effects. The calcium salt of penicillin was later found to produce a superior aerosol. It was also preferred by patients because it had less odor and was much less likely to cause coughing. The minor side reactions observed by Barach are discussed later.

One objective of the aerosol technic is to bring the highly antibiotic penicillin into closer contact with the actual infecting organisms; this is analogous to the injection of penicillin solution into empyema cavities or into the spinal fluid in meningitis. It is thus evident that the local application and concentration of penicillin at the site of infection are more significant than the blood level or the urinary excretion of the drug. Both of these values are measures of the absorption of penicillin and not actual indications of its clinical effectiveness, at least so far as topical application is concerned. It is of interest to note, however, that penicillin is readily absorbed from the lungs; high blood levels are attained when long slow breathing, with a pause before exhaling, is practiced. Blood concentrations of from 0.01 to 0.04 unit per cubic centimeter and as high as 0.18 unit were found during the first fifteen minutes to one hour after inhalation of from 20,000 to 70,000 units.[1] In the present investigation, when the new type of nebulizer and cut off valve were used, a 50 pound (23 Kg.) boy had a blood level of 0.02 unit per cubic centimeter one hour after inhaling 7,000 units of penicillin. The blood concentration in an asthmatic man weighing 180 pounds (82 Kg.) was 0.05 unit per cubic centimeter one-half hour after a 20,000 unit inhalation. Similar concentrations were found in many other cases. Actually any desired blood level of penicillin may be obtained by the aerosol method if more frequent intermittent or continuous inhalation through an oxygen mask is employed.

The percentage recovery of penicillin in the urine varies. Using a less refined nebulizer, from 10 to 20 per cent of the total dose of penicillin was recovered in twenty-four hours in Barach's reported cases;[1] using more efficient apparatus the recovery ranged from 30 to 50 per cent.[7] With slow, deep inhalations that are held for several seconds, urinary recovery is greater because the blood concentration is generally higher.

TECHNIC AND DOSAGE

The apparatus required for the nebulization of penicillin is available from most oxygen equipment companies and may be obtained for about $10 if a small portable oxygen tank is used. A physician with ten or more outfits can treat at least 20 cases a week without nursing assistance, once the method of using the apparatus is understood by the patient. Outfits may be placed in the home for use of patients too ill to come to the office.

The apparatus now used consists of an oxygen tank equipped with a valve for controlling the flow of oxygen at about 4 liters per minute. (Optionally, another automatic valve may also be used to cut off the flow of oxygen except during inspiration.) Oxygen flows to the Vaponephrin nebulizer by tubing attached to the intake arm. A Y tube is inserted at some point in the rubber tubing, leaving one arm of the Y free. The aperture at the top of the nebulizer is left open. An improvement consists in the attachment of a 1,000 cc. bulb with a hole at the top to the original nebulizer at the carburetor. This permits some economy in the use of penicillin, but it is not essential. This apparatus has been found satisfactory. Barach describes some modifications of it in his report.

Sodium penicillin[8] (or the calcium salt) is prepared by dissolving the drug in sterile isotonic solution of sodium chloride in such amounts that from 0.5 to 1 cc. contains the desired dosage. As a rule the dose in adults is 25,000 in 1 cc., although 50,000 units per cubic centimeter is frequently used. After nebulization of the penicillin solution, 0.5 cc. of isotonic solution of sodium chloride is injected into the nebulizer and also inhaled, thus avoiding waste of penicillin. (An aqueous solution of penicillin is irritating when inhaled. The lighter colored preparations are preferred by patients because they taste better.) In cases of sinusitis, neosynephrin or privine is used as nose drops to open the sinuses; in asthma and other conditions causing bronchospasm 0.5 cc. of 0.25 per cent neosynephrine may first be inhaled from the nebulizer so that penicillin may be more effectively brought into contact with the desired areas. The nebulizer must be rinsed out before subsequent use with penicillin. In ambulatory patients, office treatments are usually given three to five times daily at three or four hour intervals. Medication may be continued during the night by patients having the apparatus at home. In conditions involving local accumulations of pus it may be advisable to reinforce the inhalations by injections into the involved area, as in empyema. A nose and throat spray containing 500 units per cubic centimeter is sometimes used at home.

The technic of inhalation consists in placing the mouthpiece of the nebulizer in the mouth or nose and inhaling slowly and deeply, then holding the breath for several seconds to permit deposition of the penicillin particles and to prevent its loss during expiration, and then exhaling. Since the flow of oxygen passes out through the open arm of the Y tube, little oxygen enters the nebulizer until the finger is placed on this arm. The actions of breathing and diverting oxygen into the nebulizer are synchronized. With the nebulizer well within the mouth and the lungs empty, a finger of the nurse or patient is placed on the Y tube opening (thus starting immediate nebulization) and the patient at the same time begins a slow inspiration. Before inspiration is quite complete, the finger is removed from the Y tube, inspiration is completed and held for several seconds, and then expiration is allowed. With this technic little or no vapor can be seen on exhalation. Some patients cannot breathe deeply, but holding the breath will help deposit penicillin in the respiratory tissues. Part of the penicillin solution is also inhaled through the nose; the side of the nose not in use must be closed by finger pressure. The method of inhalation is readily learned by patients and can be carried out unattended save for preliminary instruction. Children as young as 2 years have been successfully given courses of inhalation.

7. Barach, Alvan L.: Personal communication to the author.

8. Schenley Laboratories, E. R. Squibb & Sons and Winthrop Chemical Company, Inc., provided the penicillin.

A modification of this technic consists in attaching a positive pressure oxygen mask to the nebulizer containing penicillin solution. This may be utilized routinely for babies, or for adults for whom the continuous inhalation of oxygen is also desired to prevent pulmonary edema.

The blood concentration can be maintained at any desired level. Barach found blood concentrations as high as 0.4 unit per cubic centimeter using a single inhalation of 100,000 units. Continuous inhalation would therefore seem to be an adequate substitute for the unpleasant continuous intravenous drip method of administration. The blood concentration may be maintained at an effective level by varying the strength of the penicillin solution to be nebulized and the rate of nebulization.

Penicillin may also be nebulized through a catheter directly into infected antrums or sphenoid sinuses after preliminary evacuation and irrigation. For this purpose the upper opening of the nebulizer must be closed by a cork or the finger. No irritation is caused by an aerosol of a solution containing 20,000 units of penicillin per cubic centimeter.

PROCEDURE

Penicillin therapy should be considered as only one factor in the general treatment of the patient. Most penicillin failures, aside from its use against nonsusceptible organisms, occur when the physician fails to recognize and treat such conditions as medical shock, diabetes mellitus, pernicious anemia, achylia gastrica, severe or even mild nutritional failures due to prolonged malnutrition or anorexia and vomiting, congenital conditions leading to rickets or conditions of the gallbladder and bile ducts causing depletion of the bile-soluble vitamins, and allergies due to pollens, foods and other irritants. Penicillin has been found to act more effectively in patients who are in or are brought into a state of adequate nutrition. Therefore supplementary treatment with various vitamins and crude liver extract (Campolon) is often employed.[9]

The procedure in this investigation has been to treat all underlying factors by standard available methods along with aerosol penicillin. Before beginning treatment a thorough physical examination is made. Wherever possible, cultures[10] are taken from the nose, throat and sputum and cultured in nutrient-blood broth and mouse peritoneum. Pneumococci are typed by the direct method and hemolytic streptococci[11] by the Swift-Wilson-Lancefield technic. Determinations of the blood count, hemoglobin and erythrocyte sedimentation rate and routine urinalysis are usually carried out. Psychosomatic evaluation of the patient is important. Roentgenograms of the lungs and sinuses are obtained when indicated. In many cases special tests such as those for pollens, danders, feathers and house dust are required, and nonallergic diets must be provided to eliminate food allergies. Electrocardiograms, renal and liver function tests as well as chemical examination of the blood and urine may be necessary. Foci of infection, such as bad teeth and useless tonsils, should be removed.

9. Claussen (in Harvey Lectures, 1941-1943, Lancaster, Pa., Science Press, 1943, vol. 38, p. 37.) reported that patients with chronic infections have very low levels of plasma vitamin A, and conversely that the resistance factors of the host are lowered in any condition in which the vitamin A saturation of the liver, plasma and tissues is depleted. These observations have been confirmed by other investigators.

10. Eli Gardiner, Ph.D., aided materially in the bacteriologic procedures and carried out the streptococcus typing.

11. E. R. Squibb & Sons supplied the hemolytic streptococcus typing serums.

TYPES OF CASES SUITABLE FOR AEROSOL THERAPY

Over 200 patients with various upper respiratory conditions, or manifesting allergic reactions to an upper respiratory infection, have been treated with aerosol penicillin. Since a full report of these highly diversified cases would not be practical for presentation at one time, only the more common manifestations of upper respiratory infections are reported here. Since it may be of interest to indicate the variety of cases successfully treated by aerosol penicillin, the following classification is presented. It must be borne in mind that such bizarre complaints as migraine, eczema, rosacea, duodenal pain, allergic colitis, extreme fatigue and even mild psychoneurotic symptoms may in fact be either due to, or aggravated by, allergy to the presence of a mild chronic or acute upper respiratory infection.

I. Acute primary invasions of the respiratory tissues with and without pneumonitis:

- A. Pneumococcus types.
- B. Hemolytic streptococcus and staphylococcus types.
- C. Virus types with secondary invasions of hemolytic streptococci and staphylococci and the nonhemolytic streptococcus MG group.

II. Persistent bacterial infections of the upper respiratory tract due to pneumococci (thirty-five types), hemolytic streptococci (forty types) and staphylococci, with acute pneumonic episodes without allergic manifestations.

III. Persistent bacterial infections of the upper respiratory tract which develop into bacterial allergies in the constitutionally nonallergic patient.

IV. Upper respiratory bacterial infections which develop into bacterial allergies in individuals who have an allergic type of constitution in combination with other extrinsic allergies:

- A. Sinobronchitis.
- B. Eczema.
- C. Asthma.
- D. Migraine:
  1. With headache as the predominant symptom.
  2. With hemicrania and simulated trifacial neuralgia, with or without biliary viscerospasm.
  3. Intestinal crises without headache.
  4. Psychotic or psychosomatic types.

V. Chronic upper respiratory bacterial infections with acute fatigue persisting for years in allergic and nonallergic subjects.

VI. Acute and chronic upper respiratory bacterial infections which lead to glomerulonephritis and hypertension, sinusitis with nephrosis, and myocarditis with and without hypertension.

PNEUMONITIS

The use of aerosol penicillin in the treatment of pneumonitis is entirely logical, since it brings the drug into very close contact with the infecting organisms. It is true, of course, that penicillin by parenteral routes has proved very effective in pneumonitis due to many susceptible bacteria. However, the applicability of aerosol penicillin to home use without trained assistance is of definite advantage, in addition to the fact that the highest concentration of penicillin is attained in the diseased tissues. The usual treatment of pneumonitis in the adult consists in the inhalation of 50,000 units every three or four hours or a continuous inhalation of nebulized penicillin through the Barach positive pressure oxygen mask. In severe cases a combination of aerosol and parenteral penicillin has been found more effective, inhalations and injections being given alternately at two hour intervals. Although interstitial virus pneumonitis does not in itself respond to penicillin, the use of positive pressure oxygen inhalation helps prevent pulmonary edema, and penicillin eradicates the secondary invaders, pneumococci, hemolytic streptococci and hemolytic

staphylococci, which are usually considered to be the actual cause of death in virus pneumonitis.[12] The course of the disease is shortened and disability is less severe.

It is advisable to take cultures of the sputum and nasopharynx to determine the infecting organism before penicillin therapy is started. Certain bacteria, such as Hemophilus influenzae (Pfeiffer's bacillus) and some strains of Staphylococcus aureus, are resistant to the action of penicillin but may respond to sulfonamides. The amount of penicillin required in pneumonitis depends to some extent on the infecting agent. Pneumococci are more sensitive on the whole than streptococci or staphylococci; the latter often require very large doses.

Over 30 cases of pneumonitis due to various organisms have been successfully treated with aerosol penicillin alone or in conjunction with parenteral penicillin. Examples of acute and chronic pneumonitis are given:

Acute pneumonitis. M. McG., a boy aged 14 years, was brought to the office after being sent home from boarding school. He was nervous, "jittery" and apprehensive and had a dry irritating cough. His temperature was 102 F. Physical examination showed moderate diffuse pharyngitis and very little postnasal drip or drainage from the sinuses. There was a moderate amount of dulness over the right lower lobe posteriorly and many fine moist rales. The leukocyte count was 28,000, 85 per cent polymorphonuclears, the sedimentation rate was increased, and the hemoglobin was 17.5 mg. per hundred cubic centimeters. Nasopharyngeal cultures and sputum were secured for study; these subsequently showed pneumococcus type XX. He was given an inhalation of 40,000 units of penicillin and taken home. Three hours later when he returned for another treatment he was much improved. Four inhalations were given that day and one intramuscular injection of 25,000 units at 2 a. m. On the second day the patient felt so well that he wanted to walk home. Treatment was continued for a week. The chest signs disappeared completely by the third day; he was lively and had lost all nervousness and apprehension. During the next two weeks an inhalation was given in the morning and evening. Three days after penicillin was stopped no pneumococci could be found by culture.

This boy was seen at the onset of acute pneumococcic pneumonitis. Early diagnosis and aerosol penicillin treatment were responsible for checking the spread of infection at once. Moreover, the boy was in an excellent frame of mind after the first day and was up and about most of the time. This immediate response and relative feeling of well-being are characteristic of aerosol penicillin therapy in pneumonitis and have been noted repeatedly. In fact, patients can be made to understand only with difficulty how ill they were or might have been.

Pneumonitis with allergies to persistent pneumococcic infection. H. S., a man aged 45, was first seen with pneumonitis. The leukocyte count was 12,000, 75 per cent polymorphonuclears, and the sedimentation rate (Westergren) 38 mm. per hour. Type VII pneumococcus was demonstrated by direct typing. After treatment for three weeks with 5 Gm. of sulfadiazine daily and frequent injections of crude liver extract, the patient still had disabling symptoms consisting of profuse sweating on exertion, nervousness, attacks of acute abdominal pain and occasional loose watery stools. Most of these symptoms, which persisted for two months, could be classified as allergic reactions to the persistent type VII pneumococcus infection. Roentgenograms revealed resolving pneumonitis at the apex of the right lung. No extrinsic allergies could be found.

When aerosol penicillin became available, the chronic pneumococcic infection was treated with aerosol penicillin, 20,000 units four times a day for three days, followed by 30,000 units once a day for a week while at work. After the first four inhalations the patient felt well and his symptoms appeared to be eliminated. The cultures were negative after treatment was stopped. He has continued in excellent health.

It is apparent that in this case aerosol penicillin cured a chronic pneumococcic infection that was resistant to sulfadiazine. Had the aerosol penicillin technic been available earlier, this patient might have been spared months of disability.

It may be of interest to note that, in the epidemic of an unclassified virus disease of the upper respiratory tract during the late winter months, aerosol penicillin was used to good effect. While the virus infection itself was probably not influenced by the drug, the patients frequently were definitely benefited because secondary bacterial infections did not arise to complicate the original disease. Many patients appeared to be well after treatment for one or two days although penicillin was continued for about five days. Perhaps one factor in the rapid recoveries was the general feeling of well being and the increased appetite which commonly accompany aerosol penicillin therapy. Similarly the duration of colds has been repeatedly shortened because of the elimination of secondary bacterial invasions. This was noted especially in patients who usually develop a heavy cough with much sputum a few days after the first symptoms of the cold appear.

TONSILLITIS, SINUSITIS AND SINOBRONCHITIS

Tonsillitis, sinusitis and sinobronchitis are three conditions forming a rather large proportion of cases in any general practice, particularly in the New York City area. Sulfonamides have all too often been of little value, no matter how freely they have been used. As far as parenteral penicillin therapy is concerned, acute sinusitis has been reported to yield to penicillin fairly regularly, but chronic tonsillitis and chronic sinusitis have all too often resisted its action;[13] administration locally by drops, sprays and irrigations may be of limited value.[14] Similarly the results of parenteral penicillin therapy in sinobronchitis have not been uniformly satisfactory. Experience with aerosol penicillin has, however, been far more encouraging, perhaps because the drug is deposited at the sites of infection.

It is important in treating sinusitis to precede the use of aerosol penicillin with application of a vasoconstrictor in the form of drops or a spray in the nose. For the treatment of sinusitis the nebulizer is inserted into the nares through which penicillin solution is inhaled. Often it has been found advisable to continue single daily prophylactic inhalations for a week or so after the infection is apparently controlled. A penicillin nose spray is frequently employed in the evening at home during the acute phase. In some cases of chronic suppuration of the sphenoids or antrums it is necessary to wash out the pus by catheter and then introduce 20,000 units of penicillin mist through the catheter. The mist is much less irritating than a 20,000 unit solution of penicillin and far more efficient than a solution of 250 units per cubic centimeter. If the nasal structure does not cause too much anatomic blockage, aerosol penicillin readily penetrates into the ethmoid cells after shrinkage with privine. When polyps are present, aerosol penicillin acts better after their removal.

12. MacCallum, W. G., and Dochez, A. R.: Personal communication to the author. Cecil, R. L.: A Textbook of Medicine, ed. 6, Philadelphia, W. B. Saunders Company, 1943.

13. Putney, F. J.: Uses of Penicillin in Diseases of the Nose and Throat, J. A. M. A. **126**: 620 (Nov. 4) 1944.

14. Woern, W. H.: Penicillin in Ear, Nose and Throat, Arizona Med. **2**: 33 (Jan.) 1945. Hauser, I. J., and Work, W. P.: Treatment of Sinusitis with Penicillin, Arch. Otolaryng. **41**: 161 (March) 1945.

Tonsillitis. L. B., a man aged 32, was first seen at the office on February 23 complaining of acute epigastric pain which had been treated unsuccessfully for five weeks by antacids and a Sippy diet. He had a history of indigestion for years and repeated attacks of tonsillitis, the latest three months previously. The patient was obviously suffering acute pain, probably due to pylorospasm. Tenderness was present only over the epigastrium. The tonsils were enlarged, and purulent exudate could be expressed. Other abnormal findings were a blood pressure of 150/100 lying and 120/80 standing; a leukocyte count of 14,000 with 78 per cent polymorphonuclears; sedimentation rate (Westergren) 28 mm. in one hour. A throat culture taken at this time subsequently showed a nonhemolytic streptococcus and Streptococcus viridans. At later visits the electrocardiogram was normal; roentgenographic examination of the heart and lungs was negative. The first attempt to obtain roentgenograms of the gastrointestinal tract failed because duodenal contractions prevented the passage of barium. Three days later, after an injection of isonipecaine (Demerol), barium passed into the duodenum without difficulty. No abnormality could be visualized. The gastric analysis after histamine stimulation was slightly above normal.

Immediate relief of the severe pain was obtained with 50 mg. of isonipecaine given hypodermically. This was indicative, since isonipecaine relieves vagotonia and viscerospasm similarly to its effect on the vagotonia of asthma. A tentative diagnosis of gastrointestinal allergy to the tonsillar infection warranted a course of aerosol penicillin, 30,000 units every four hours. After the third inhalation, the pain from viscerospasm was completely absent. On the third day the patient had a single inhalation and then went to work, not returning until 8 o'clock in the evening. Later that night severe pains developed in the epigastrium, left shoulder and arm, intercostal muscles and left pectoralis muscle simulating angina pectoris. The leukocyte count and sedimentation rate were normal but a throat culture was later reported positive for pneumococcus type III. A course of penicillin was given intramuscularly, 25,000 units every four hours. After three days all muscular pain had disappeared, but the tonsils were still enlarged and contained purulent exudate. Aerosol penicillin was then given four times daily for three days, at which time the tonsils seemed to have shrunk to small masses of scar tissue. Two days after withdrawal of penicillin, all symptoms returned and the culture again showed pneumococcus type III. A final course of aerosol penicillin was given at home for seven days, with relief of all symptoms. Cultures were negative two days and one month after the end of treatment. The electrocardiogram, leukocyte count and sedimentation rate were normal. Because the tonsils do not look really healthy and are probably useless, tonsillectomy has been advised.

This involved case history is given rather fully to illustrate two points: First, allergic symptoms simulating viscerospasm and, later, angina pectoris were completely relieved by apparent cure of a type III pneumococcus infection of the tonsils. Second, aerosol penicillin succeeded in eliminating pneumococci from the tonsils, whereas large amounts of penicillin given intramuscularly failed to do so; moreover, the tonsils were smaller and more nearly normal after aerosol penicillin but remained large after parenteral therapy. Other patients with allergic disturbances due to chronic tonsillitis preferred to undergo tonsillectomy, preceded and followed by aerosol penicillin for three and four days, respectively. The course of treatment is shorter and chances of relapse much less when the tonsils are not retained. Surgical removal of foci of infection, such as the tonsils, is much less hazardous, and persistent infections are more frequently eliminated when penicillin treatment precedes and follows the operation.

Acute sinusitis. C. R., a woman aged 26, had her tonsils removed in infancy. At the age of 20 an attack of sinobronchitis persisted for several months. Roentgenograms showed a mild pneumonitis, which resolved during a month in Florida. Recently the patient had an acute attack of sinusitis involving both antrums and ethmoids; cultures showed nonhemolytic streptococci, Staphylococcus albus and pneumococcus type VI. The infection was cured in two days with 200,000 units of penicillin. Findings were negative five months later.

It seems possible, in view of the previous history of sinobronchitis, that a recurrence of that condition was prevented by immediate treatment of the sinusitis at the onset of pain.

Chronic sinobronchitis. D. T., a woman aged 32, had lost many weeks of work for several years because of attacks of relapsing sinobronchitis lasting two or three weeks. In the latest episode, slight fever, pronounced fatigue and a productive cough were present. Sputum and throat cultures revealed only a nonhemolytic streptococcus; roentgenograms of the chest were negative for tuberculosis and bronchiectasis. Although the patient was unaware of allergic symptoms, skin tests revealed positive reactions to feathers and house dust. Fatigue and cough disappeared with a high vitamin intake and three inhalations daily of 40,000 units of penicillin for five days, in combination with a penicillin nose spray of 250 units per cubic centimeter at night. The productive cough recurred in mild degree after the patient fluffed up some feather pillows, but it was again controlled almost completely with a few treatments of aerosol penicillin. As a prophylactic measure the patient continued taking a single daily inhalation for several weeks, since she was constantly exposed to upper respiratory infections. Immunization for the extrinsic allergies has been started.

The rapid action of aerosol penicillin in sinobronchitis is illustrated by this patient, who was able to return to work feeling well after five days' treatment, as contrasted with the protracted course of previous attacks.

At least 40 cases of sinusitis and sinobronchitis have been successfully treated with aerosol penicillin. Many cases have been complicated, as in the case of D. T., by extrinsic allergies which in themselves may produce respiratory symptoms. Zinsser,[15] among others, has pointed out that when a chronic bacterial infection is eliminated the hyperergic state of the individual is diminished and food, pollen and other antigens cause few or no symptoms. In other words, the presence of a bacterial infection accentuates the allergic reactions to extraneous antigens.

ACUTE PHARYNGITIS ASSOCIATED WITH GASTROINTESTINAL SYMPTOMS

Patients are often seen with complaints localized in various portions of the body for which no definite etiology is easily discernible. Here the necessity of a thorough physical examination is more than ever of importance. Gastrointestinal upsets often fall into this category. Intrinsic bacterial allergy, heretofore a diagnosis which all too infrequently has entered into consideration, is receiving increasing recognition in the causation of obscure complaints referred to the gastrointestinal tract, the skin, the circulatory system and the respiratory apparatus. Recently it has been found that gastrointestinal complaints may be traced more or less directly to an infection of the upper respiratory tract.

Fourteen infants were seen primarily because of gastrointestinal disorders. These children had symptoms ranging from anorexia to vomiting, with or without loose stools loaded with mucus; in 2 cases there were green slimy stools containing undigested food and fats; persistent vomiting and constipation occurred in 2 cases, and in 2 other infants there were frequent very watery stools. Most of the babies were moderately sick and cried intermittently. Several had so-called colic, without other signs. Physical examination was generally negative except for moderate dehydration and, in all cases,

15. Zinsser, Hans: Resistance to Infectious Diseases, ed. 4, New York, Macmillan Company, 1931.

diffuse pharyngitis. Temperatures were never over 101 F. The white blood cell count varied from 12,000 leukocytes with 20 per cent polymorphonuclears to 25,000 leukocytes with 85 per cent polymorphonuclears. In 1 case with a hemolytic streptococcus throat infection the leukocyte count was 8,000, polymorphonuclears 4 per cent; after two treatments the polymorphonuclears increased to 40 per cent. The sedimentation rates ranged from 3 to 6 mm. per hour (Landau). The organisms identified by culture were hemolytic streptococcus, Neisseria catarrhalis, Staphylococcus aureus and Staphylococcus albus; in 1 case pneumococcus type XXXII was isolated.

Because of the pharyngitis all infants were treated with penicillin inhalations through the Barach-Eckman oxygen mask. After the first inhalation of 10,000 units the babies were more interested in eating, and the gastrointestinal symptoms were relieved. Second and third inhalations of 5,000 units were given to insure improvement or cure of vomiting and abnormal stools. Cultures of the throat were negative after therapy. More prolonged follow-up treatment was carried out when the infecting organism was a hemolytic streptococcus. However, in the normal infant very little penicillin treatment is usually required to eliminate symptoms arising from mild bacterial invasions of the upper respiratory tract.

A number of adults have been seen in whom treatment of a mild or chronic pharyngitis resulted in the relief of severe nausea and vomiting, acute gastric pain, migraine, hypertension and a Ménière-like syndrome. A report of these cases will be presented at a later date.

Pneumococcic pharyngitis and sinusitis associated with hyperemesis gravidarum. L. W., a woman aged 30, was depleted from almost continuous hyperemesis gravidarum when first seen in the fourth month of pregnancy. The only abnormal findings were a postnasal drip, mild pharyngitis and a leukocyte count of 13,000, with 76 per cent polymorphonuclears. Pneumococcus type XIII was found in throat cultures. The prolonged depletion was treated with parenteral injections of crude liver extract together with vitamins of the B complex and A, D, K and C. Because of the upper respiratory tract infection, 10,000 units of penicillin was added to the intramuscular injection of vitamins A and D in oil. After this treatment in the morning the patient ate a large meal at noon. In the evening she was troubled by anorexia and abdominal pain with emesis.

Since it appeared that bacterial allergy was a predominant factor, operating through the mechanism of intestinal migraine, ergotamine tartrate (Ergotrate) was given parenterally with temporary relief of symptoms. The patient was then given two aerosol penicillin treatments daily, and emesis stopped. The treatments were reduced to one daily, and on the following day vomiting again occurred in the evening. Complete relief of symptoms, without relapse, was finally obtained by four penicillin inhalations daily for five days. Whatever the actual mechanism of hyperemesis gravidarum in this case, it seems likely that there was an intrinsic allergy to pneumococcus type XIII. Complete remission of nausea and vomiting was attained with the control of pharyngitis and sinusitis.

INTRINSIC BRONCHIAL ASTHMA

The concept of intrinsic bronchial asthma, as distinguished from extrinsic asthma, has recently entered more frequently into consideration in the differential diagnosis of asthma.[16] The prognosis of the disease is often very poor, and many patients suffering from the condition actually depend on epinephrine for their continued survival. The theory that a chronic bacterial infection in the upper respiratory tract is the causative factor in intrinsic asthma is gaining acceptance. Some success has attended the treatment of bronchial asthma with nebulized solutions of sulfathiazole,[17] often in combination with adrenergic bronchial dilators.

The earliest report on the application of penicillin in intrinsic bacterial asthma is that of Schonwald and Deppe,[18] who used the drug with good results, although only very small and infrequent doses were given. Hampton and his co-workers[19] studied 9 patients with asthma of many years' duration, of which group 8 patients reacted positively to extracts of common pollens, inhalants and foods. Elimination and injection therapy failed to alter the asthmatic state in any case. It was then assumed that the etiology was a primary bronchial infection (bacterial allergy). The patients received a course of at least 500,000 units of penicillin intramuscularly and later 500,000 units intratracheally by means of a pressure spray through a curved cannula extending to the base of the protruded tongue. There was slight clinical improvement in 4 cases, but not enough to indicate that penicillin offered any real advantages. It may be argued that with these methods of giving penicillin the drug did not reach the bacteria present in the respiratory tissues and excretions in sufficiently high concentrations to be effective. The droplets produced by the pressure spray were probably of too large a size to penetrate into the bronchioles.

Barach,[1] on the other hand, reported striking success in at least 2 cases of bronchial asthma, 1 of eight months' and 1 of twenty-five years' duration. Other patients, in whom emphysema, chronic bronchitis or both were also present, responded at least temporarily. It should be noted that these were all advanced cases, and aerosol penicillin was given arbitrarily for only ten days at most in an attempt to evaluate the technic. It is entirely possible that treatment over a longer period of time would cure more cases of severe bronchial asthma.

My experience has been more encouraging than that of Barach, probably because the cases treated had not progressed to the severe intractable stage with definite tissue change present in Barach's series. Aerosol penicillin has been very successful in 25 cases of bronchial asthma, a number of which also showed extrinsic allergies to foods, pollens or danders. While the disease may appear to be cured by a five day course of aerosol penicillin, it is advisable to continue therapy in diminishing amounts and then in single daily or weekly prophylactic doses for a number of weeks. Two cases are given here:

W. H., a boy aged 5 years, had relapsing episodes of sinusitis and bronchial asthma for three years. These attacks followed an acute upper respiratory infection with pyelonephritis and urinary frequency at the age of 2 years; leukocytosis was always present during these episodes. Throat cultures revealed hemolytic streptococcus (not typed) and pneumococcus type II. All skin tests for common irritants were negative. Penicillin was first used parenterally, 10,000 units every four hours for seven days, for one of these episodes. Temporary relief was followed promptly by a relapse. This was treated with a second course of parenteral penicillin, and relapse again occurred promptly. Finally aerosol penicillin was given, with complete relief of all symptoms, and no asthmatic symptoms have appeared in seven months. Several upper respiratory infections were aborted immediately by a few penicillin inhalations.

16. Cohen, M. B.: Bronchial Asthma: Classification Based on Etiological and Pathological Factors, Ann. Int. Med. **20**: 590 (April) 1944.

17. Applebaum, I. L.: The Treatment of Bronchial Lesions by the Inhalation of Nebulized Solution of Sodium Sulfathiazole, Dis. of Chest **10**: 415 (Sept.-Oct.) 1944.

18. Schonwald, Philipp, and Deppe, E. F.: Penicillium Antibiotic in the Treatment of Intrinsic Allergies, Northwest Med. **44**: 10 (Jan.) 1945.

19. Hampton, S. F.; Wine, M. B.; Allen, Wendell; Thompson, C. S., and Starr, M. P.: The Clinical Use of Penicillin, J. A. M. A. **127**: 1108 (April 28) 1945.

M. G., a girl aged 10 years, had practically continuous episodes of sinobronchitis every winter to such an extent that she was never able to go to school. This condition had been present for eight years. She had never been very asthmatic, but the cough was very annoying and persistent. Ragweed hay fever occurred every fall. When first seen in September 1944 she had an upper respiratory infection involving both antrums and ethmoids, diffuse bronchitis and asthma. Many moist rales and rhonchi were heard in both lungs. There were no changes in breath sounds and no dulness. Roentgenograms revealed no signs of tuberculosis, pulmonary consolidation or bronchiectasis. She was found to be allergic to ragweed, house dust and feathers.

Initial treatment, 200,000 units of penicillin in doses of 20,000 units every four hours intramuscularly, was followed by a well defined general improvement, but a week later there was a relapse. The antrums were black to transillumination, and the condition of the lungs was about the same as when she was first seen. Penicillin therapy, 20,000 units four times a day intramuscularly, combined with a penicillin nose spray of 500 units per cubic centimeter, and sulfadiazine 0.5 Gm. daily, were given for seven days and then reduced to 20,000 units intramuscularly twice a day. It was two weeks before the antrums became clear to transillumination. The lung signs finally cleared up only when aerosol penicillin, 20,000 units four times a day, was given for five days. During all this time the child went to school every day for the first time in her life. She was treated from September to January more or less intensively and has felt well since treatment was instituted. From January to March she received one dose of aerosol penicillin once a week, 25,000 units, as a prophylactic measure. On March 8 she contracted what seemed to be a virus infection. The only bacteria detected on culture of the sputum and nasopharynx were nonhemolytic streptococci. Penicillin 20,000 units every four hours was administered for a week, and no sinusitis or bronchitis developed. Following this she had three days of aerosol penicillin, 25,000 units three times a day. In April she had a mild case of mumps. In May she had a slight cold with no sign of bronchial infection. At the present time she is in very good health and is getting ragweed and house dust immunizations twice weekly.

A pronounced side effect of combined aerosol penicillin and desensitization therapy for allergies, observed in this patient, will now be described.

SIDE EFFECTS OF AEROSOL PENICILLIN

A hitherto unreported side effect of penicillin therapy occurred in patient M. G. and in 1 other. If an aerosol penicillin treatment is given simultaneously or within a few hours of a pollen immunization or vaccine, severe allergic reactions develop; these are characterized by acute abdominal pain and urticaria, severe nervousness, restlessness and angioneurotic edema. Isonipecaine 50 mg., given either orally or parenterally, controlled the reaction within a few minutes. Aerosol penicillin alone never caused the reaction. The only other allergic reaction to penicillin was mild urticaria, which was relieved by Torantil (histaminase) within several hours. This occurred in 2 extrinsically allergic patients with sinusitis and is due to the pigment or other impurities present in commercial penicillin.

A few patients of Barach [1] complained of soreness under the sternum and an irritated throat after treatment with aerosol penicillin for a few days. Coughing sometimes was troublesome. Hampton [19] was forced to discontinue the use of an intratracheal penicillin spray in 1 patient with intrinsic bacterial asthma because an attack was precipitated with each attempted treatment. The occasional coughing observed in my cases was not troublesome. It was a normal physiologic manifestation of the disease rather than a reaction to aerosol penicillin per se.

On several occasions patients mentioned the development of a sore throat sometime during the course of aerosol penicillin. The throats looked red and edematous. However, despite the continuation of aerosol penicillin, the throats became normal within the course of a few days. During the time this series of cases was treated, various unclassified virus diseases were prevalent in the community. It is felt that most patients complaining of sore throats had acquired an intercurrent virus infection or a highly resistant hemolytic staphylococcic infection.

The penicillin nose spray sometimes caused slight irritation, but in the same patients aerosol penicillin in much stronger concentration was nonirritating.

COMMENT

The average physician in general practice is not yet making full use of the potentialities of penicillin, probably because of the present inherent need of frequent and regular administration and its concomitant difficulties. In life endangering infections the drawbacks are minimized by hospitalization, although the inconvenience and dislike of frequent injections remain. The administration of penicillin by inhalation is suggested as a valuable substitute for the usual technic. It is an adaptable method, useful in the home by untrained persons and in the office. It can be utilized for continuous or intermittent administration of penicillin in severe as well as in less dangerous chronic infections, in which from three to five treatments during the day apparently are sufficient to effect removal of the infection. As demonstrated in the cases reported here, aerosol penicillin, as compared with parenteral penicillin, is usually more effective in the treatment of chronic and acute upper respiratory infections, with or without other systemic manifestations. The rapid clinical improvement in such stubborn conditions as intrinsic bacterial asthma is notable and encourages one to hope that at last a promising therapeutic weapon is available for that intractable condition. Likewise the amelioration and often the elimination of such manifestations as migraine, hypertension, chronic fatigue, gastrointestinal disturbances and fibromyositis, with the removal of chronic bacterial infections of the upper respiratory tract by aerosol penicillin, are startling and almost must be observed to be believed. The elimination of such bizarre concomitants of upper respiratory infection is difficult to explain unless the possibility of allergic reactions to a bacterial infection is entertained. Only a beginning at exploration of the widely varied ramifications of bacterial hypersensitivity has been made. It is entirely possible that penicillin may be a powerful and logical weapon in attacking this problem.

It must be emphasized that aerosol penicillin was repeatedly found to control infections of the upper respiratory tract which were not cured by parenteral penicillin or relapsed after its use. Plummer,[20] in a study of the treatment of hemolytic streptococcic pharyngitis and tonsillitis with parenteral penicillin, found that the organisms again could be cultured from the nasopharynx after cessation of treatment and relapse occurred within a few days. This occurred in 4 out of 9 patients treated for fewer than four days, in none treated for ten days. Such relapses did not occur in patients given aerosol penicillin. The use of intra-

20. Plummer, Norman; Duerschner, Dorothy R.; Warren, Harold D.; Rogliano, Francis T., and Sloan, Ruell A.: Penicillin Therapy in Hemolytic Streptococcic Pharyngitis and Tonsillitis, J. A. M. A. **127**: 369 (Feb. 17) 1945.

tracheal sprays of penicillin, as reported by Hampton,[19] was also far less effective than aerosol penicillin in bronchial asthma. From these and other data [21] which have appeared since this report was submitted it is apparent that a strong case can be built up for the effectiveness of the local deposition of penicillin in the upper respiratory tract by inhalation of an aerosol.

Aerosol penicillin is not claimed to be a cure-all. It failed to influence the course of rheumatic fever, rheumatoid arthritis and other conditions in which penicillin has generally been ineffective. It has, however, surpassed other known technics in the persistent upper respiratory infections that cause so much chronic illness and disability and offer such a challenge to the physician. On the basis of its promising results, the method deserves a wider trial so that its value can be more accurately determined, especially when other methods are used to increase the individual's resistance to reinfection.

SUMMARY

The disabilities of more than 200 patients have been relieved or improved by adequate doses of aerosol penicillin, a technic whereby a highly concentrated solution of penicillin is inhaled as a mist. The cases fall into groups, the common denominator of which is a bacterial invasion of the respiratory tissues, including the paranasal sinuses, often associated with underlying disturbances. Although the disabilities are not all serious, they have produced prolonged periods of inactivity and loss of work. Many are of serious significance, as for example bacterial asthma, in which the mortality rate is high.

The conditions treated successfully include acute and relapsing pneumonitis due to various cocci; tonsillitis, sinusitis and sinobronchitis; pharyngitis with gastrointestinal manifestations, and intrinsic bacterial asthma. Several other manifestations of bacterial allergy (migraine, hypertension, eczema, rosacea, colitis, extreme fatigue and even mild psychoneurosis) associated with upper respiratory infections were treated with encouraging results.

The advantages of aerosol penicillin over parenteral administration, especially when respiratory invasions are under treatment, are many and include ease and adaptability of administration in the home or office through a mouthpiece or oxygen mask, relative cheapness, and local and systemic effectiveness. The inhalation of penicillin mist in concentrated doses introduces the therapeutic agent directly into the site of bacterial invasion and produces a very high local concentration. Moreover, a constant antibiotic blood level of penicillin may be produced by continuous penicillin inhalation through a positive pressure oxygen mask.

In addition to specific treatment of the bacterial invasion, management of the underlying factors is imperative. Parenteral crude liver extract and vitamin therapy are still important adjuncts to the specific treatment of most types of infection. Combined therapy has been effective and readily managed in general practice.

A previously unreported side effect of penicillin was observed in 2 allergic patients.

The aerosol penicillin technic is offered as a valuable new method for the general practitioner.

74 Ascan Avenue.

21. Mutch, N., and Rewell, R. E.: Penicillin by Inhalation, Lancet **1**: 650 (May 26) 1945. Hagens, E. W.; Karp, Mary, and Farmer, C. J.: Inhalation Method for Penicillin Therapy: Preliminary Report, Arch. Otolaryng. **41**: 333 (May) 1945. Olsen, A. M.: Nebulized Penicillin: Preliminary Report of Its Role in the Management of Surgical Bronchiectasis, Proc. Staff Meet., Mayo Clin. **20**: 184 (June 13) 1945.

PENICILLIN X

COMPARISON WITH PENICILLIN G WITH RESPECT TO SENSITIVITY OF PATHOGENIC ORGANISMS AND SERUM LEVELS

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Several forms of penicillin have been identified in cultures of Penicillium notatum. Three of these, known as penicillin F, G and X in this country and as penicillin I, II and III respectively in Great Britain, have been isolated in crystalline form.[1] Other active substances have also been described which differ from these three in that they are probably proteins, nondiffusible, active only in the presence of glucose and are effective against gram negative as well as gram positive bacteria. The latter have been variously labeled notatin, penatin, penicillin B and "second factor" but are all closely related or identical.[2]

Commercial penicilins prepared from deep vat cultures consist almost entirely of penicillin G, but those prepared from shallow surface cultures in flasks may contain appreciable amounts of penicillin X varying up to 20 or 25 per cent.[3]

The only published paper in which more than mention is made of penicillin X is a brief one by workers of the Food and Drug Administration.[4] That paper contains a summary of some of its properties and the results of a clinical trial in gonorrhea. When assayed by the cup-plate method, the potency of crystalline penicillin X is appropriately 900 Oxford units per milligram while crystalline penicillin G has a potency of 1,650 units per milligram. These workers found penicillin X to be more effective in vitro against a strain of type A Friedländer's bacillus and a strain of Bacillus cereus. They found no difference between penicillin X and commercial penicillin on four strains of Staphylococcus aureus, but in preliminary studies the former was found to be three to five times more effective than the latter in protecting mice against 10,000 lethal doses of

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pneumococcus type I. In the treatment of gonorrhea they obtained bacteriologic cures in 64 of 68 cases (94 per cent) with a single intramuscular injection of 25,000 units of penicillin X but only 37 cures in 58 comparable cases (64 per cent) treated with a single intramuscular injection of 25,000 units of commercial penicillin. Moreover, 3 of the patients in whom they failed to obtain a cure with commercial penicillin were cured by a subsequent treatment with a single injection of 25,000 units of penicillin X. Consistently higher blood concentrations of penicillin X, as determined by a serial dilution technic in which Bacillus subtilis was used as the test organism, were maintained during the first two hours after an intramuscular injection, and the penicillin X was excreted into the urine somewhat more slowly than commercial penicillin.

Two preparations, one containing 65 and the other more than 90 per cent of penicillin X, were available for the studies to be reported in this paper.[5] These studies fall into three catagories: (1) Strains of bacteria obtained from clinical cases were tested simultaneously for their sensitivity to these two preparations and to various lots of commercial penicillin, (2) serum levels were compared after intramuscular injections in the same subjects and the levels obtained during therapy with different doses given by intermittent intramuscular injections were also compared, and (3) a preliminary clinical trial was made in a small number of cases mostly of pneumonias and gonococcic infections.

5. These were supplied by the Lederle Laboratories and Cutter Laboratories.

COMPARISON OF SENSITIVITY OF BACTERIAL STRAINS TO PENICILLIN X AND TO COMMERCIAL PENICILLIN

The tests for sensitivity were done in suitable mediums by the serial dilution method of Rammelkamp and Maxon,[6] using 0.5 cc. amounts of both culture and penicillin solutions. Pathogenic strains, most of them from recent cases, were used. The staphylococci were all coagulase positive and included F. D. A. No. 209 P, one of those certified for penicillin standardization.[1] Various types were included among the group A streptococci, pneumococci and meningococci. Some of the strains were tested simultaneously with only one lot of each kind of penicillin, while others were tested at the same time with both lots of penicillin X and with one or more lots of commercial penicillin. The results of all the comparisons are shown in the table.

Comparative Sensitivity of Bacterial Strains to Penicillin X and to Commercial Penicillin

Comparative Sensitivities *	Staphylococcus Aureus	Group A Streptococcus	Streptococcus Viridans	Pneumococcus	Gonococcus	Meningococcus	Streptococcus 98 †	Total, Excluding Staphylococcus Aureus
More sensitive to X than to G								
8-fold: complete	..	2	..	..	2	1	1	6
inhibition	..	4	..	..	2	..	3	9
4-fold: complete	..	62	..	..	8	9	9	88
inhibition	..	45	2	2	9	17	12	87
2-fold: complete	3	45	11	10	20	13	19	118
inhibition	3	19	8	13	9	2	8	59
Same sensitivity to X and G	48	6	10	15	9	1	..	41
More sensitive to G than to X								
2-fold: inhibition	8	1	..	2	2	..	1	6
complete	10							
4-fold: inhibition	2							
complete	3							
Totals: Number of tests	77	184	31	42	61	43	53	414
Number of strains	17	134	10	19	29	12	1	205
Comparisons of 5 lots of G								
Same sensitivity	11	15	3	2	3	8	1	32
2-fold: inhibition	3	8	2	3	2	1	5	21
complete	2	3	..	..	..	1	2	6
4-fold: inhibition	1	..	..	1	1	..	..	2
complete								
Totals: Number of tests	17	26	5	6	6	10	8	61
Number of strains	17	26	5	6	6	10	1	54
Two lots of X compared								
More sensitive to lot L								
2-fold: complete	2	..	..	..	3	..	..	3
inhibition	..	2	1	1	3	1	1	9
Same sensitivity	13	2	5	3	7	3	4	24
More sensitive to lot C								
2-fold: inhibition	1	8	2	3	4	5	3	25
complete	2	11	2	3	7	1	3	27
4-fold: inhibition	..	3	..	1	2	1	..	7
Totals: Number of strains	17	26	10	11	26	11	11	95
Number of tests	17	26	10	11	22	11	1	81

* Commercial lots are referred to as G. † Not included in the previous columns. Complete = no growth on subculture; Inhibition = no visible growth at 18 hours, growth on subculture. Not included in the table are tests with three strains of Friedländer's bacillus and one strain of Hemophilus influenzae which were equally resistant to the lots of X and G.

It should be borne in mind that the standardizations of all penicillin preparations, according to international agreement,[1] is made with certified strains of Staphylococcus aureus which have the same sensitivity to penicillin F and G. Different strains of staphylococci, however, are known to vary considerably in their sensitivity to commercial penicillin [7] and this was shown

6. Rammelkamp, C. H., and Maxon, T.: Resistance of Staphylococcus Aureus to the Action of Penicillin, Proc. Soc. Exper. Biol. & Med. **51**: 386 (Dec.) 1942.

7. Abraham, E. P.; Florey, H. W.; Chain, E.; Fletcher, C. M.; Gardner, A. D.; Heatley, N. G., and Jennings, M. A.: Further Observations on Penicillin, Lancet **2**: 177 (Aug. 16) 1941. Spink, W. W.; Ferris, V., and Vivino, J. J.: Comparative In Vitro Resistance of Staphylococcus to Penicillin and to Sodium Sulfathiazole, Proc. Soc. Exper. Biol. & Med. **55**: 207 (March) 1944. Garrod, L. P.: The Laboratory Control of Penicillin Treatment, Brit. M. J. **1**: 528 (April 15) 1944. Rantz, L. A., and Kirby, W. M. M.: The Action of Penicillin on the Staphylococcus in Vitro, J. Immunol. **48**: 335 (June) 1944. Gallardo, E.: Sensitivity of Bacteria from Infected Wounds to Penicillin: II. Results in One Hundred and Twelve Cases, War Med. **7**: 100 (Feb.) 1945. Rammelkamp and Maxon.[6]

elsewhere to be true for the strains used in this study.[8] The present comparisons of the sensitivities of these strains of staphylococcus to penicillin X and G show that in the vast majorities of instances they were equally sensitive to X and G, to the two lots of X and to the various lots of G. The differences that were noted were mostly twofold and, interestingly enough, the strains showed greater sensitivity to the commercial preparations more often than to the lots of penicillin X. These findings tend to rule out differences in the standardization as a basis of the differences in the sensitivities noted with the other organisms.

All of the organisms other than the staphylococci were generally more sensitive to penicillin X than to penicillin G. Most of the group A streptococci, gonococci and meningococci were from two to eight times more sensitive to penicillin X than to penicillin G. Most of the strains of Streptococcus viridans and of pneumococcus were twice as sensitive to X as to G. Three strains of Friedländer's bacillus and one of Hemophilus influenzae were equally resistant to the two. The significance of these comparisons is emphasized by the fact that when the sensitivity of these strains was tested with different lots of commercial penicillin the results usually agreed, and the differences observed with any two lots favored the one about as often as the other.

The two lots of penicillin X were essentially identical in their effects on the various strains of Staphylococcus aureus. Most of the other organisms showed either the same sensitivity to the two lots or a twofold difference, but they were generally more sensitive to lot C than to lot L, the latter containing only 65 per cent of penicillin X.

The standard strain of hemolytic streptococcus, No. 98, which was used for the determinations of serum levels, was included every time that other organisms were tested. The results of all the tests in which the sensitivity of this strain to different lots of penicillin was compared are also shown in the table. They did not differ essentially from the aggregate of the results obtained with the other strains of group A streptococci.

SERUM LEVELS

After Single Doses in the Same Subjects.—Ten convalescent patients were each given single intramuscular injections of 20,000 units of penicillin on two successive days. On the first day 5 of them received penicillin X and the others received commercial penicillin; on the second day each one received the alternate kind of penicillin. Blood was taken at hourly intervals for five hours after each dose, and the levels in the serum were determined by the serial dilution method of Rammelkamp.[9] Human group O cells were used as an indicator. The same strain of hemolytic streptococcus, No. 98, was used throughout and the serum dilutions were added in 0.2 cc. amounts. The results are shown in chart 1 in terms of the reciprocal of the minimum serum dilution which sterilized 0.5 cc. of the culture. The corresponding concentrations of regular penicillin obtained in control tests with the same strain are also shown.

There were appreciable differences in the maximum concentrations obtained and in the persistence of demonstrable amounts of penicillin activity in the serum in the different subjects with each of the preparations used. All received the same lot of commercial penicillin, while two lots of penicillin X were given—lot L to 6 subjects and lot C to 4. The levels obtained after penicillin X were consistently higher than they were in the same subjects after the same dose of regular penicillin. The differences were two to eight fold throughout the period corresponding to that during which regular penicillin was still demonstrable in the serum. In most instances also the penicillin X was found in concentrations of 0.03 unit per cubic centimeter or more for two hours longer than the commercial penicillin could be detected in the same subjects. Of the two preparations of penicillin X, the higher and better sustained levels were obtained with lot C than with lot L.

Levels During Intramuscular Therapy.—The levels of penicillin in the serum during the intervals between intramuscular doses in a number of patients under active treatment with penicillin X on four different

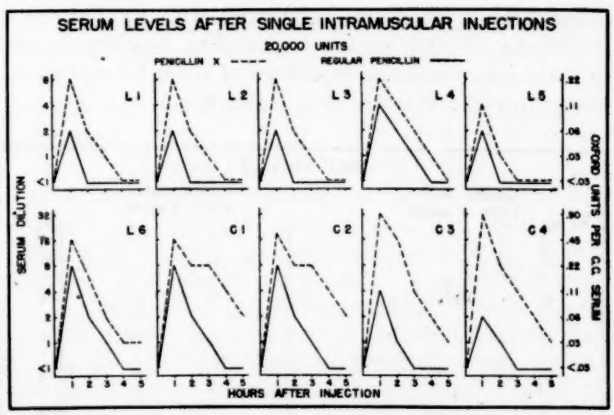

Chart 1.—Serum levels after single intramuscular injections of 20,000 units.

dosage schedules are shown in chart 2. As might be expected, the larger doses gave rise to higher and better sustained levels than the smaller ones. A similar chart of serum concentrations obtained in patients under treatment with regular penicillin is given elsewhere[10] and shows similar variations at somewhat lower levels. Comparisons of the average concentrations obtained on two similar dosage schedules of commercial penicillin and penicillin X are shown in chart 3. Values obtained in subjects with cardiac or renal insufficiency were excluded in the computation of these averages since they may be abnormally high.[10] The average levels of penicillin activity in the serum, as measured by the use of streptococcus 98, were always at least twice as high during treatment with penicillin X as they were during treatment with the same doses of regular penicillin.

In chart 3 is also shown a comparison of the average serum levels obtained during the intervals between 10,000 unit doses of penicillin X and between 20,000 unit doses of regular penicillin, each given every three hours. Except at the one-half hour interval the average

8. Meads, M.; Ory, E. M.; Wilcox, C., and Finland, M.: Penicillin Sensitivity of Strains of Six Common Pathogens and of Hemophilus Hemolyticus, J. Lab. & Clin. Med., to be published.

9. Rammelkamp, C. H.: A Method of Determining the Concentration of Penicillin in Body Fluids and Exudates, Proc. Soc. Exper. Biol. & Med. 51: 95 (Oct.) 1942.

10. Ory, E. M.; Meads, M.; Brown, B.; Wilcox, C., and Finland, M.: Penicillin Levels in Serum and in Some Body Fluids During Systemic and Local Therapy, J. Lab. & Clin. Med., to be published.

serum levels were slightly higher with the 10,000 unit doses of penicillin X than they were when twice that amount of regular penicillin was given.

CLINICAL OBSERVATIONS

A preliminary clinical trial of the use of penicillin X has been made on 75 patients. The less potent of the two preparations was used in almost all of these cases. Although the results of the studies on the sensitivity of various bacteria and the blood levels observed suggested that, as compared with regular penicillin, smaller doses spaced at longer intervals might give comparable results, no adequate attempt was made to confirm this possibility. The total doses used in most of the present cases, except in some of those of uncomplicated gonorrheal urethritis, were similar to the amounts generally employed with commercial penicillin. These doses were given chiefly for the purpose of obtaining data which could be compared with similar observations in other cases treated with regular penicillin.

Gonococcic Infections.—The difficulty of establishing a dose which would be universally effective in the treatment of gonorrhea has been pointed out recently.[11] In the present study 47 cases of uncomplicated acute gonorrheal urethritis were treated with total doses of 50,000 to 100,000 units of penicillin X given in two or three intramuscular injections at three hour intervals except for the 100,000 unit dose, which was given as

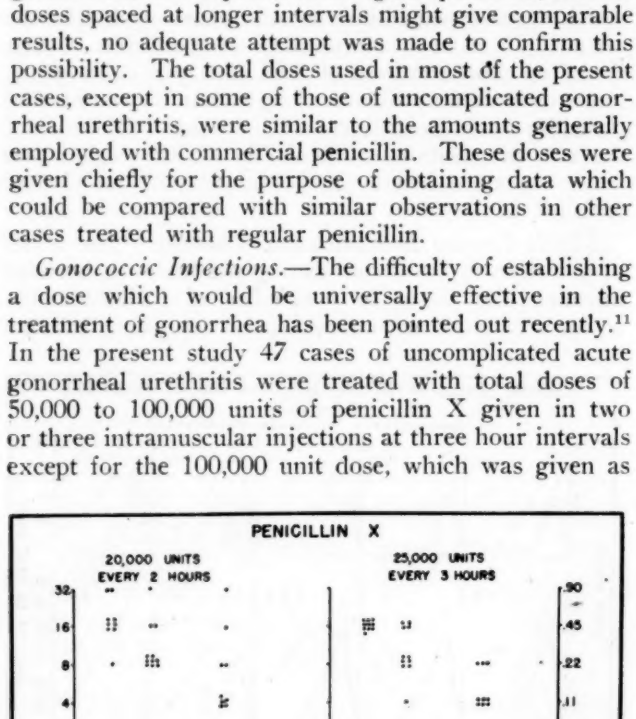
PENICILLIN X
20,000 UNITS EVERY 2 HOURS
25,000 UNITS EVERY 3 HOURS
10,000 UNITS EVERY 3 HOURS
15,000 UNITS EVERY 3 HOURS
SERUM DILUTION
OXFORD UNITS PER C.C. SERUM
HOURS AFTER DOSE

Chart 2.—Serum levels obtained during the intervals between intramuscular injections in different patients under treatment with various doses of penicillin X.

five injections at two hour intervals. A total dose of 75,000 units was used on 23 patients and 50,000 or 60,000 units on 14. There were two definite failures, one after 75,000 units and the other after 50,000 units. In addition, 7 patients had clinical and bacteriologic cures for two or three weeks and subsequently returned with fresh infections after further admitted exposures to known sources of infection. Some of these reinfections responded with complete cure after smaller doses

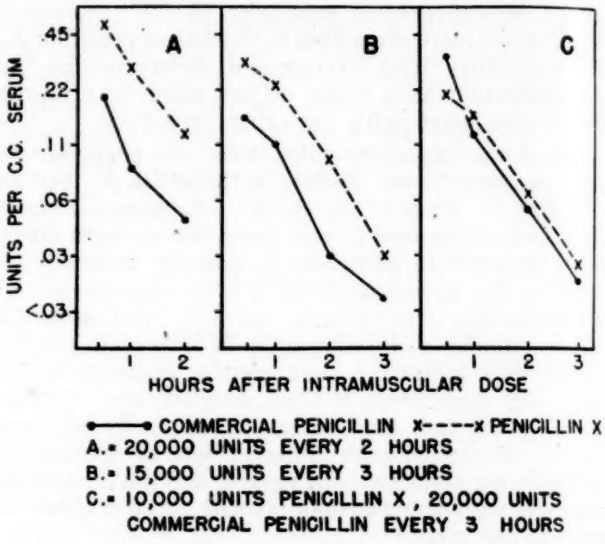
A
B
C
UNITS PER C.C. SERUM
HOURS AFTER INTRAMUSCULAR DOSE
COMMERCIAL PENICILLIN x----x PENICILLIN X
A.• 20,000 UNITS EVERY 2 HOURS
B.• 15,000 UNITS EVERY 3 HOURS
C.• 10,000 UNITS PENICILLIN X, 20,000 UNITS COMMERCIAL PENICILLIN EVERY 3 HOURS

Chart 3.—Comparison of average levels of penicillin activity in the serum of patients under treatment with various doses of commercial penicillin and penicillin X. Each point represents the average of at least ten observations in as many patients without cardiac or renal insufficiency.

than those used to treat the original infection. In 1 instance the organism isolated in the original infection was sulfonamide resistant while that cultured during the reinfection was highly susceptible.

The clinical impression gained from the close observation of these cases was that they responded somewhat more rapidly and more completely than cases treated with the usual 100,000 units of regular penicillin given in five injections at two hour intervals. This was generally evidenced by the rapid disappearance of symptoms and of discharge and the failure to find more than occasional leukocytes in prostatic secretions obtained on the day following treatment. This was in sharp contrast to the findings after the administration of large doses of oral preparations, when, in spite of negative bacteriologic findings in smears and cultures, the discharge and the symptoms often persisted longer than after the routine treatment with regular penicillin given intramuscularly.[12]

In cases of gonorrheal arthritis and epididymitis too the clinical response was quite rapid. Five patients with well established arthritis and purulent urethritis were treated with 20,000 units intramuscularly every three hours and single intra-articular doses of 5,000 to 15,000 units. All were entirely free from signs of infection within twenty-four hours, although stiffness and soreness in the joints persisted for several days during which the treatment was continued. In 2 additional patients there was joint tenderness and pain without swelling accompanying an acute urethritis, and a complete cure was effected in each instance by a total of 100,000 units given in four doses at three hour intervals. Two patients with severe epididymitis were completely relieved except for slight residual tender-

11. Lapenta, R. G.; Weckstein, A. M., and Sarnoff, H.: The Inadequacy of a Standardized Dosage of Penicillin in the Treatment of Gonococcic Urethritis, J. A. M. A. **128**: 168 (May 19) 1945. Seabaugh, D. R.: Penicillin in Treatment of Gonorrhea, J. Missouri M. A. **42**: 272 (May) 1945.

12. Finland, M.; Meads, M., and Ory, E. M.: Oral Penicillin, J. A. M. A., to be published.

ness after the first day of treatment. One of them had urinary retention, probably resulting from acute prostatitis, and was relieved fairly promptly after the first injection was given.

Pneumonia.—Fourteen cases were treated with doses of 15,000 units of penicillin X every three hours. One patient, 72 years old, with diffuse bronchopneumonia of undetermined etiology complicating severe blood loss and congestive heart failure, died after two days of treatment. The others all had typical primary lobar pneumonia, previously untreated. A pneumococcus was identified from the sputum in 11 of these cases. They were all of moderate severity, but only 1 had a positive blood culture before treatment. They all responded promptly and were essentially afebrile and symptom free within twenty-four hours.

One additional case of a recurrent pneumococcus type 29 bacteremia in the terminal stages of obstructive jaundice from carcinoma of the ampulla of Vater was treated. The bacteremia cleared rapidly, but the same organism was found at autopsy in multiple miliary abscesses of the lung mixed with Friedländer's and influenza bacilli.

Other Infections.—A case of staphylococcic bacteremia and pneumonia complicating carcinoma of the lung was treated for a few days with doses of 20,000 units every three hours. The bacteremia was rapidly cleared, but the pulmonary symptoms persisted. Three patients with severe and extensive cellulitis were treated with penicillin X. One of them had a severe aplastic type of anemia with agranulocytosis and died after two days of treatment. The other 2 showed rapid symptomatic improvement without further extension of the lesions, which then cleared over a period of a week. One received 15,000 units every three hours, and the other 20,000 units every four hours.

COMMENT

The methods used both in determining the sensitivity of bacteria and in estimating the serum concentrations are admittedly crude. Before the introduction of the international standards,[1] the assay of the various commercial preparations of penicillin were likewise quite crude and involved appreciable errors.[13] Possibly some of those errors and other discrepancies were due to variations in the proportions of the different forms of penicillin, as pointed out by others.[14] It is most unlikely, however, that the consistent differences between the commercial preparations and the lots of penicillin X observed in the present studies could be explained on the basis of such errors. The similarity of the results obtained with the different lots of commercial penicillin serves to emphasize the superiority of the penicillin X.

The serum levels were determined with the use of a strain of hemolytic streptococcus which was more sensitive to penicillin X than to penicillin G. While this at first glance may seem to give only an illusion of higher levels with the preparation of X, it is nevertheless an expression of greater serum activity against the test strain. Since most of the other strains tested, exclusive of the staphylococci, showed a similarly greater in vitro sensitivity to penicillin X, a comparable superiority in therapeutic effect may be anticipated in infections with these strains.

13. Hunter, A. C., and Randall, W. A.: Standardization of Assay of Penicillin, J. A. Off. Agric. Chemists **27**: 430 (Aug. 15) 1944.
14. Penicillin Failures, editorial, U. S. Nav. M. Bull. **44**: 1083 (May) 1945. Penicillin Variations, J. A. M. A. **128**: 736 (July 7) 1945.

The present results were obtained with commercial preparations which probably contained negligible amounts of penicillin X and were contrasted with lots containing different amounts of the latter form. Even the two lots of penicillin X showed appreciable differences in activity. Further studies are necessary to determine whether preparations made on a commercial scale from surface cultures and containing smaller amounts of penicillin X will show a proportionate superiority over the preparations which consist almost entirely of penicillin G.

It is obviously not possible to draw any definite conclusions from the results of the present preliminary clinical trial. The numbers of cases are too few and they were not adequately controlled to justify any deductions as to the therapeutic superiority of penicillin X. As far as one could judge from observing the patients clinically, the results of treatment with penicillin X were at least as good as those seen in similar cases treated with commercial lots. The gonococcic infections seemed to respond more rapidly and more completely. These results indicated that penicillin X, like regular penicillin, is nontoxic and highly effective in susceptible infections.

It still remains to be seen whether comparable clinical results can be achieved with significantly smaller doses or longer intervals by the use of penicillin X or with preparations containing an appreciable proportion of that form.

SUMMARY AND CONCLUSIONS

When tested simultaneously with preparations containing 65 per cent or more of penicillin X and with commercial lots which consist almost entirely of penicillin G, most strains of group A hemolytic streptococcus, gonococcus and meningococcus were from two to eight times more sensitive to penicillin X, most strains of pneumococcus and Streptococcus viridans were twice as sensitive to penicillin X and most of the staphylococci were equally sensitive to the two kinds of penicillin.

Levels of penicillin activity in the serum against a strain of hemolytic streptococcus were significantly higher and sustained longer after intramuscular injections of penicillin X than after injections of the same number of units of regular penicillin.

These findings suggest that comparable therapeutic results may be expected with the use of smaller doses or with the same doses given at longer intervals when penicillin X is used.

A preliminary clinical trial indicated that penicillin X is nontoxic and at least as effective as regular penicillin in the same doses in cases of pneumonia and probably more effective in gonococcic infections. Further clinical trials with the use of smaller doses and longer intervals are necessary in orders to establish the therapeutic superiority of penicillin X.

Barber Surgeons.—Barber surgeons in the Middle Ages would notify the public that the time for bleeding had arrived by displaying a blood-soaked bandage at their doors, the origin of the familiar red-striped barber pole. The barber shops of Baghdad literally streamed with blood during the propitious periods for bloodletting. The practice of bloodletting was rigidly adhered to in the cloisters of the Church.—Gordon, Benjamin Lee: The Romance of Medicine, Philadelphia, F. A. Davis Company, 1944.

LOW SODIUM CHLORIDE INTAKE IN THE TREATMENT OF INSOMNIA AND TENSION STATES

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Low sodium chloride dietary intake has been attempted in the treatment of epilepsy, migraine, Ménière's syndrome, hypertension, cardiac insufficiency and certain renal conditions with considerable success. In the treatment of epilepsy it has generally been regarded as efficacious in increasing the therapeutic effectiveness of bromides, while a number of authors have maintained that increased salt intake increases the frequency of convulsive seizures. In earlier dietetic literature, Friedenwald and Ruhräh,[1] for instance, in their discussion of the role of restricted salt intake, refer to past empirical clinical observations in which such a regimen was noted to have benefited certain "extremely nervous and irritable individuals."

Delaville and Tscherniakofsky [2] investigated the chloride content of the brains of a group of mental patients at autopsy and found increased chloride retention in most of these, thus suggesting the possibility of some relationship between certain mental disorders and chloride metabolism.

Von Noorden [3] noted beneficial effects following the administration of a low salt diet to what he classed as "neurasthenic patients" but apparently believed that these effects were due to purely psychic-suggestive factors rather than to any specific effects associated with salt reduction. Nevertheless, it is of interest that von Noorden observed diminution in the skin reactivity to external stimuli in patients who had been deprived of sodium chloride in their diets. He attached particular significance to the resulting dehydration and increase of calcium ions in the tissues following sodium depletion. This view was supported by R. Schultz,[4] who found that the cutaneous reactivity of the scalp was notably increased on a rich sodium chloride intake. In animal experiment Vogt [5] clearly confirmed the earlier observations of Wertheimer and Abderhalden [5] that acidifying diets tended to increase skin irritability in rabbits, while alkalizing diets had the reverse effect. Further evidence accumulated revealed that the irritability of nerve tissue in vitro was increased by the excess of sodium ions and decreased by the addition of calcium ions. Clinically it was well known that a low sodium chloride intake altered the body fluids in the direction of alkalinity and that excessive loss of chloride as a result of prolonged vomiting, for instance, would lead to alkalosis and tetany.

On the other hand, we are all quite familiar with the beneficial effects of a high sodium chloride intake in Addison's disease and of the interesting psychic effects of salt insufficiency in the addisonian patient. Further, that the addition of adequate amounts of sodium chloride to the diets of such patients frequently results in striking improvement in mental well-being. Recently Johnson [6] reported observations on a group of persons suffering from mild degrees of hypotension, chronic exhaustion and lack of drive accompanied by a moderate degree of mental depression, in whom he found relatively low blood chloride levels not exceeding 450 mg. of chlorides per hundred cubic centimeters of whole blood; however, he did not report whether these patients had impaired chloride retention. He reported beneficial effects in all of these patients following the addition of 2 to 6 Gm. of salt to their daily diet, noting gratifying symptomatic relief after four to five days, with a return to the former symptoms following the removal of the added salt.

On the basis of these observations concerning the role which sodium chloride appears to play in certain mental disorders, it seemed appropriate to attempt to observe the effects of salt reduction in patients suffering from severe tension and insomnia states.

SUBJECTS AND PROCEDURE

Observations were conducted on a group of 20 patients with pronounced insomnia, nervous tension, anxiety and increased emotional lability. They ranged in age from 20 to 53 years. Sixteen were men and 4 women. Six were postmorphine addicts,[7] 6 were merchant seamen [8] suffering from so-called convoy fatigue with insomnia and anxiety, and 8 were patients under treatment at the New York State Psychiatric Institute. Of this latter group of 8 cases 4 had been diagnosed as psychoneurotic, 4 as early cases of schizophrenia. All patients were observed for a minimum period of one week prior to being placed on a restricted salt regimen, during which time their behavior in the ward and their nocturnal sleep were observed. In each case the blood and urinary chlorides were determined prior to treatment, and in 9 subjects the urinary chloride excretion was carefully checked at intervals throughout the treatment period. The blood chloride controls were not continued, as they were not considered a reliable indicator of the body chloride level, since low tissue levels have been observed despite higher blood values.[9] Diurnal electroencephalographic tracings were done on the control group of 8 patients before, during and after the dietary regimen. Nocturnal electroencephalographic records, unfortunately, could not be obtained at the time. The method of salt reduction consisted in utilizing a low salt, neutral ash diet which contained considerable leafy vegetables and potatoes, to which approximately 0.5 to 2 Gm. of sodium chloride was added daily. This high potassium-containing diet furthered the chloride excretion. Five subjects in the series were given severely restricted diets containing not over 0.5 Gm. of salt per

Dr. Bernard L. Pacella made the electroencephalographic recordings and interpretations. Dr. Irville H. Mackinnon selected the patients.

Read at the centennial meeting of the American Psychiatric Association and before the Section of Neurology and Psychiatry, District of Columbia Medical Society, Washington, D. C., on Dec. 7, 1944.

Dr. Nolan D. C. Lewis, director of the New York State Psychiatric Institute, and Dr. Frank. M. Faget, chief medical officer of the Ellis Island Marine Hospital, U. S. Public Health Service, made this investigation possible.

Dr. Ernst P. Pick of Columbia University guided in the preparation of some of the material of the manuscript and conducted parallel animal experiments in order to shed some light on the physiologic mechanisms involved in sodium chloride depletion.

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7. U. S. Public Health Hospital, Lexington, Ky.
8. U. S. Marine Hospital, Ellis Island, N. Y.
9. See comments by J. P. Peters on pages 299 and 300 of G. C. Duncan's Diseases of Metabolism (Philadelphia, W. B. Saunders Company, 1942).

day for a limited period. During the period of observation no other treatment was administered, and sedative medication was withheld except when absolutely essential. The subjects were permitted to maintain the same daily routine to which they were previously accustomed. After completion of the preliminary clinical and laboratory control observations the subjects were placed on a low salt regimen for periods varying from twenty-one to forty-two days. During this time the length and character of sleep, blood pressure, weight and urine output were recorded. Fasting blood sugar was controlled in 3 patients. For control purposes the aforementioned 9 subjects were given 9 Gm. of sodium chloride daily in the form of enteric coated tablets and were kept on the salt restricted diet for an additional two to three weeks. Subsequent to this the regular hospital diet was resumed and the sodium chloride tablets were discontinued. The aim of the control procedure was to add an amount of salt which would be consistent with an approximately normal intake. Since most authorities agreed that the average daily intake of salt may vary from 10 to 30 Gm., and that 3 to 5 Gm. is usually sufficient to maintain an adequate body chloride level, it was decided to add 9 Gm. daily to the experimental diet for control purposes. Actually under normal conditions not over 5 Gm. is assimilated daily by the body, the surplus being excreted via the kidneys, the sweat glands and the gastrointestinal tract.

The following criteria regarding the character of sleep served as guides in observing these patients: The onset, duration, continuity and regularity of sleep, motility during sleep, ability to fall asleep after being awakened, diurnal drowsiness and afternoon sleep, and rest obtained from sleep as well as dream phenomena were noted. In addition, the general psychiatric picture including mood, concentrating ability and activity drive of the patients were observed.

OBSERVATIONS

During the initial period of the diet the usual diuretic effects were observed and the loss of body fluids appeared to parallel closely the chloride excretion. In no instance was dehydration or weight loss important. After four to seven days on the diet the majority of the patients began to exhibit a gradual decline in nervous tension, irritability, activity drive and restlessness, accompanied by increased ability to fall asleep and a general improvement in the character of sleep. It will be noted (figs. 1, 2 and 3) that the urinary chloride excretion remained consistently lower than prior to treatment. Physical signs such as diminution of reflex activity, reduced skin reactivity and diminished finger tremor were noted. There were consistent gradual declines in blood pressure varying from 10 to 40 mm. systolic and moderate decline in pulse rate, usually falling to low normal levels, ranging from 60 to 72. It was further observed that when a definite decline in urinary chloride excretion was achieved the subjects fatigued more readily, tending to retire at an earlier hour, usually falling asleep within ten to fifteen minutes, and sleeping soundly until awakened at 6 a. m. The maximum amount of sleep permitted was eight hours. As far as could be observed by the attendants, motility during sleep appeared considerably reduced. It was consistently noted that when the subjects were awakened by a desire to urinate during the phase of increased diuresis they readily fell asleep again, whereas formerly they had experienced considerable difficulty in regaining sleep after awakening. After two to three weeks on the diet a notable decline or absence of dream phenomena was consistently observed among the subjects. In several patients there was not only a substantial lengthening of the duration of sleep but also a tendency toward drowsiness during the afternoon hours accompanied by signs of moderate muscular fatigue. Some of the subjects formed the regular habit of taking afternoon catnaps, to which they were not previously accustomed.

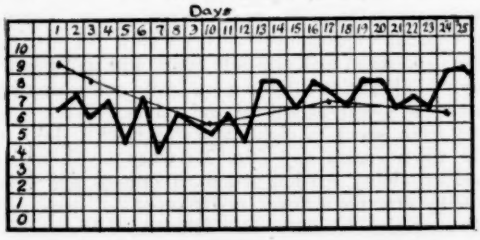

Fig. 1 (case 1).—Comparison of sleep and urine chloride excretion. Heavy line, hours of sleep; light line, grams of urine chloride.

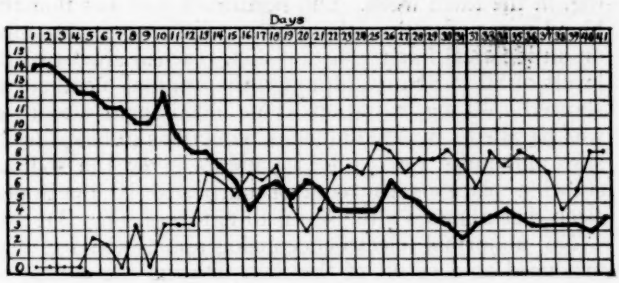

Fig. 2 (case 2).—Comparison of sleep and urine chloride excretion. Heavy line, grams of urine chloride. Light line, hours of sleep.

In general, psychomotor activity was reduced and the patients appeared more relaxed and in some instances even phlegmatic. There was a reduction in nocturnal emissions and of sex dreams in some cases. In general, a distinct decline in the intensity of emotional response became discernible, and the subjects no longer seemed unduly excited by incidents which formerly evoked manifest signs of emotional disturbance. In some of the patients on the severely salt restricted regimen the effect bordered on apathy, patients generally giving an impression of increased calm and stability. Following the onset of more normal sleep habits, general improvement in mood was observed. There was improved ability to concentrate, as revealed by the manner in which patients performed various tasks. One subject who had been unusually tense observed that he was able to concentrate satisfactorily on reading material for the first time in the twenty-nine months he had been at the institution. Three of the subjects suffering from frequent severe headaches which had contributed appreciably to their emotional state and insomnia obtained partial or complete relief after two or three weeks on the diet. One subject suffered from an intermittent peripheral vascular disorder diagnosed as Raynaud's disease, characterized by periodic episodes of numbness, pain and blanching of the extremities, hands and feet, accompanied by considerably increased psychic tension and anxiety. He exhibited pupil dilatation and considerable perspiration, particularly from the volar surfaces of the hands and feet. After approximately three weeks on the diet this subject showed considerable relief from his vascular disorder, rested better and made a general impression of increased stability, calm and

diminished anxiety and tension. Of the patients treated, 3 failed to respond satisfactorily and the diet was discontinued. Two of these were patients with a fairly high degree of habituation and physical dependence on barbiturates, and 1 of the latter was a schizophrenic with accentuated delusional activity.

The fasting blood sugar levels on 3 controlled subjects showed a considerable decline, varying from 10 to 40 mg. in the third week. The significant fact was that the blood sugar of each of these patients, though maintained on an identical fairly constant diet, reached almost equal levels of 80 to 81 mg., although the original blood sugar showed a 40 mg. variation. This blood sugar alteration was paralleled by simultaneous reductions in blood pressure and pulse rate. Of 13 patients given the sodium chloride placebos for control purposes, 10 developed sleep disturbances after seven to ten days. (fig. 3).

No abnormal electroencephalographic activity was produced as a result of the diet. During the course of clinical improvement there was generally an increase in the alpha index, with some diminution in the incidence and regularity of alpha activity during periods of increased tension (fig. 4).

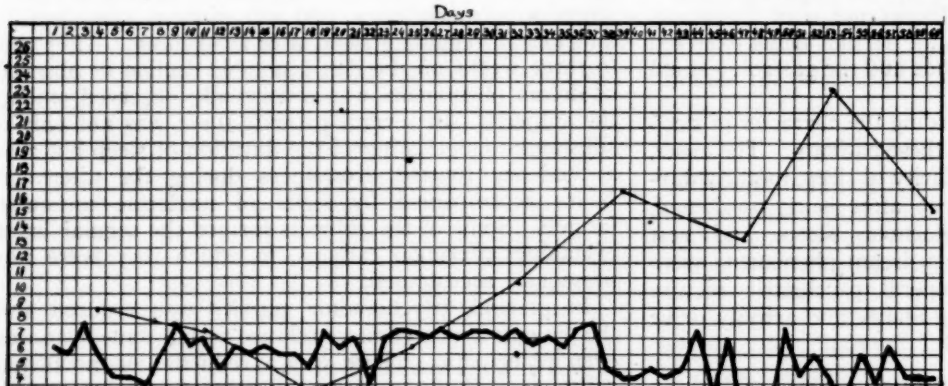

Fig. 3 (M. S., Psychiatric Institute).—Note that on the eighteenth day 2 Gm. of sodium chloride was added to the salt restricted regimen owing to the fact that the urine chloride excretion had fallen to less than 4 Gm. in twenty-four hours, thus causing an upward deviation of chloride excretion curve. This chart illustrates the effect of giving sodium chloride disguised as placebos during the control phase. The arrow indicates the point when the control salt was given. Note the reduction and irregularities in the pattern of sleep after nine days on the salt control. See figure 4 for electroencephalographic alterations on this patient. The patient was permitted a considerable increase in meat and milk intake during the control phase, thus causing a fairly considerable increase in the sodium chloride excretion.

Some of the representative case histories follow:

REPORT OF CASES

Case 1.—C. T., a white woman aged 24, admitted to the Psychiatric Institute on Feb. 29, 1944, exhibited noticeable anxiety, seclusiveness and preoccupation over certain obsessive ideas accompanied by a considerable dread of falling asleep for the past several months. It was observed that she showed little social drive and obvious feelings of insecurity in the presence of others. She would manifest periodic attacks of forced breathing, staring into space motionless with intermittent crying spells, which would stop abruptly. She had frequent fearful dreams, usually associated with delusions of being attacked violently with resulting physical harm. The low salt diet was instituted, and all sedative medication which she had been receiving for five weeks at the institute with unsatisfactory therapeutic results and for some time previous to admission was discontinued.

During the initial period on the diet, the patient showed considerable diurnal tension and sleep irregularity. A notable improvement occurred on the thirteenth day, when she appeared considerably relaxed, her anxiety greatly reduced, and she slept for eight and one-half hours. From this time on she showed continual improvement with much improvement of her mental state paralleling her improved sleep, as can be noted from figure 1. More recent data revealed that this improvement persisted: the patient showed weight increase, appeared calmer and was able to participate better in various activities such as bridge and ping-pong, which she had refused previously. Improvement in mood was striking, following her improvement in sleep. She discussed her conflicts without producing the sharp emotional discharge which was manifested previously. She had no fearful dreams during the period of improved rest. Of further interest is the fact that when later given enteric coated salt tablets (9 Gm. daily) she showed a rather rapid return toward her former mental state and sleep disturbance.

Case 2.—I. Z., a white man aged 43, admitted to Ellis Island Marine Hospital on Jan. 27, 1944, complained of a high degree of emotional irritability, restlessness and insomnia, accompanied by symptoms of dizziness of a periodic paroxysmal character, palpitation of the heart and sweating. The patient gave a history of a long persisting state of increased tension and insomnia, which followed industrial chronic mercury poisoning incurred five years before. For several years he received considerable amounts of barbiturates and later bromides, building up a considerable dependence on these drugs, but stated that he obtained little subjective relief from them. He stated that he had had no such medication in the last year.

The patient was placed in an observation ward for five days. It was observed that he was decidedly restless; that he slept only one or two hours per night, usually in brief catnaps with wakeful intervals. He showed signs of subjective and objective fatigue. His weight was 170 pounds (77 Kg.), his height 5 feet 8 inches (173 cm.).

On initial physical examination he appeared well nourished. His blood pressure was 130/70. There were hyperactive reflexes and fine finger tremor. The pupils were somewhat dilated and reacted promptly to light. Dermographism was increased. Most upper teeth were absent; there was some pyorrhea of the lower, with a gray zone on the gingival margin.

On Jan. 31, 1944 a salt free diet was instituted. The patient showed the usual increased diuresis and on the third day noted that his sweating was considerably reduced. It was noteworthy that after several days the patient's water intake diminished materially although he was permitted all the fluids he desired.

As seen in figure 2, following the first week on the salt restricted regimen the patient began to rest better; however, there was no especial improvement in sleep until the fifteenth night, when he slept seven and one-half hours and fell asleep without difficulty. He began to fatigue more easily and after three weeks complained of slight aching of the calves. From then on he averaged from seven to eight hours of restful sleep per night until the thirty-eighth day (fig. 2), when he showed signs of increased irritability, tension, abdominal cramps, anorexia, tremor (finger), hyperactive reflexes, restlessness and sleep disturbance. His salt excretion (urinary) had fallen to 2.94 Gm. in twenty-four hours, and his urine was consistently alkaline. This drop of from 14 to less than 3 Gm. of urinary chloride excretion per day occurred after thirty-six days on the salt restricted diet. It was concluded that the patient was alkalotic and sodium chloride was administered (6 Gm. daily), following which there was a fairly rapid improvement and relief from symptoms.

The patient exhibited a drop in urinary chloride excretion of from 14 to less than 3 Gm. in twenty-four hours. During this time he exhibited increased diuresis, losing approximately 13 pounds (6 Kg.). His blood pressure went from 130/70 to 90/58, the blood pressure beginning to show clearcut decline after two weeks on the diet and then remaining consistently low. During the time that the urinary excretion of chloride remained above

3 Gm. in twenty-four hours the patient felt relieved of his tension and showed a decided improvement in sleep. No ill effects were noted until urinary excretion fell below 3 Gm. a day.

COMMENT

With reference to the electroencephalographic findings, it is noteworthy that Liberson [10] found that subjects with insomnia show a lower percentage of records with high alpha indexes than the general population.

In evaluating the results of the moderately restricted diet containing 2 Gm. of sodium chloride daily as compared to the rigidly enforced regimen permitting not over 0.5 Gm. per day, it was our impression that the former procedure was distinctly more beneficial and better tolerated by the patients. Observations by Kirsner and his co-workers [11] and other investigators show that the nonprotein nitrogen is not elevated appreciably by gradual dechloruration. McCance and Widdowson [12] observed severe nitrogen retention following rapidly induced experimental hypochloremia and alkalosis produced by diet and sweating. Patients should be watched for signs of hypochloremia, such as excessive muscular weakness, listlessness, fatigue, anorexia, intestinal cramps and gastric upset, associated with nausea, apathy, dizziness, tachycardia, cardiac arrhythmia, muscular twitching and achlorhydria.

Although diuresis was particularly increased during the initial period of treatment, no persisting urinary frequency or bladder discomfort was noted. Diabetes mellitus, severe renal dysfunction and advanced coronary disease were considered as contraindications to this form of treatment. A word of caution might be added concerning a too rigid salt curtailment in hot weather, since the loss through perspiration is considerable and salt lost in this manner cannot be regained by the body. While under treatment no heat therapy should be administered and excessive physical exertion should be forbidden.

No harmful effects were observed in those patients receiving the moderately restricted diet. Attempts were made to stabilize the daily urinary chloride excretion at a level of 4 to 6 Gm. in twenty-four hours, and sufficient salt was added in order to achieve this level of excretion. Thus frequent checks of the urine chloride excretion and acidity are of considerable control value. A simple and sufficiently accurate method of controlling the urinary salt excretion is provided for in the test devised by Fantus,[13] which gives a definite quantitative result.[14] These determinations can best indicate the basic sodium chloride requirement of the patient. Thus complications can be avoided which might result from too prolonged salt restriction with the subsequent alterations in acid-base equilibrium and fluid balance. On the moderately restricted regimen a satisfactory stabilization level of chloride excretion is usually attained after seven to fifteen days and the sodium chloride intake can be increased to 3 to 4 Gm. daily. Patients who on initial examination showed impaired chloride retention, particularly when this is accompanied by clinical signs of chronic exhaustion, hypotension and muscular weakness, should not be subjected to this treatment.

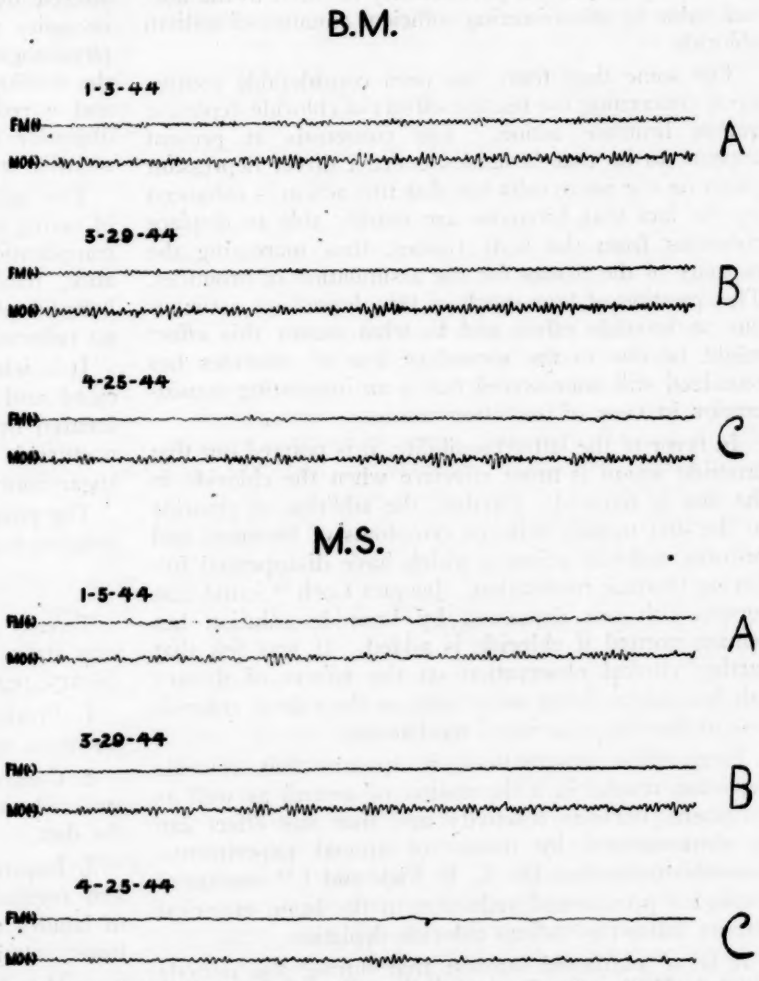

Fig. 4.—*A*, pretreatment; *B*, low sodium chloride intake; *C*, sodium chloride control.

There is evidence that a definite shift of acid-base equilibrium toward alkalinity leads not only to the symptoms of physical distress accompanying hypochloremic alkalosis but also to a state of increased irritability and sleep disturbance (fig. 2). This reversal phenomenon appears to be based on the state of acid-base balance; for instance, of interest is the fact that patients with circulatory acidosis, as in cardiac insufficiency, tolerate drastic chloride restriction quite well for considerable periods of time in contrast to patients without circulatory insufficiency. In the nonacidotic patient it is neither necessary nor wise to enforce a too rigid curtailment of salt. Reduction of the urinary chloride excretion to a level of 3 Gm. or less per day is distinctly undesirable and may even be harmful. Drastic sodium chloride restriction, according to Cohn

10. Liberson, W. T.: Functional Electroencephalography in Mental Disorders, Dis. Nerv. Sys. **5**: 357-364 (Dec.) 1944.
11. Kirsner, J. B.; Palmer, W. L., and Knowlton, K.: Studies on Experimental and Clinical Hypochloremia in Man, J. Clin. Investigation **22**: 95-102 (Jan.) 1943.
12. McCance, R. A., and Widdowson, E. M.: The Secretion of Urine in Man During Experimental Salt Deficiency, J. Physiol. **91**: 222-231 (Nov. 26) 1937.
13. A Test for Salt Depletion, Great Britain War Office, Army Medical Department Bulletin 23, May 8, 1943; abstr., Bull. War Med. **4**: 73-74 (Oct.) 1943.
14. Ten drops of a twenty-four hour urine specimen are put in a test tube with a dropper pipet followed by one drop of 20 per cent potassium chromate. Silver nitrate (2.9 per cent) is then added drop by drop and shaken until the color changes sharply from canary yellow to orange-brown. The number of drops of silver nitrate used gives the number of grams of sodium chloride per liter of urine and is calculated on the basis of the total urine output for twenty-four hours.

and Soskin,[15] tends to lower the oxidative processes in the tissues and thereby results in the accumulation of lactic acid and other fatigue products in the blood and muscles. This may be manifested in salt restricted patients by such symptomatic complaints as muscular aches and fatigue. These authors have further pointed to the important role of chloride anions and sodium cations in the transfer of oxygen from the blood to the tissues and in the removal of carbon dioxide. They have clearly demonstrated by means of both in vivo and in vitro experiments that the total oxygen consumption of dogs that have been depleted of sodium chloride is abnormally low and is permanently restored to the normal value by administering sufficient amounts of sodium chloride.

For some time there has been considerable controversy concerning the relative effects of chloride depletion versus bromide action. The consensus at present appears to be that bromides exert a direct depressant effect on the nerve cells but that this action is enhanced by the fact that bromides are readily able to displace chlorides from the body tissues, thus increasing the capacity of the tissues for the assimilation of bromides. The question of how much of this depressant action is due to bromide effect and to what extent this effect might be due to the secondary loss of chlorides has remained still unanswered but is an interesting consideration in view of our observations.

In favor of the latter possibility, it is pointed out that bromide action is more effective when the chloride in the diet is reduced. Further, the addition of chloride to the diet usually relieves symptoms of bromism and restores epileptic seizures which have disappeared following bromide medication. Jacques Loeb[16] found that certain fish are depressed by bromide solution but remain normal if chloride is added. It was felt that further clinical observation on the effects of dietary salt loss might throw more light on the role of chloride loss in the aforementioned mechanism.

From these observations it appears that chloride depletion results in a depression of central as well as peripheral nervous reactivity and that this effect can be demonstrated by means of animal experiments. Animal studies that Dr. E. P. Pick and I[17] conducted showed a pronounced reduction in the brain electrical activity following sodium chloride depletion.

It is of additional interest that during the periods of clinical improvement the reduction in nervous tension was accompanied by certain indications of reduced adrenomedullary activity, as evidenced by declines in blood sugar, blood pressure and pulse rate. Whether these alterations are due primarily to central or to peripheral factors or both is not yet clear. Further, the question as to whether the loss of sodium chloride or the increased accumulation of fatigue products acts on the central sleep centers also cannot be answered at this time.

15. Cohn, C., and Soskin, S.: Influence of Serum Chloride Concentration on Oxygen Consumption of Dogs, Am. J. Physiol. **139**: 80-83 (May) 1943. Cohn, C.; Levine, R., and Soskin, S.: Influence of Sodium Chloride Concentration in the In Vitro Oxygen Consumption of Rat Diaphragm in the Presence and Absence of Red Blood Cells, ibid. **139**: 84-88 (May) 1943.

16. Cushny, A. R.: A Textbook of Pharmacology, Philadelphia, Lea & Febiger, 1936, p. 411.

17. Pick, E. P., and Miller, M. M.: The Influence of the Loss of Diffusible Crystalloids on the Electrical Activity of the Brain, J. Neurophysiol. (Jan.) 1945.

The value of prolonged administration of sleep inducing drugs in psychiatric therapy can certainly be regarded as a sort of necessary evil. An important drawback in the use of such medication is that natural physiologic sleep is not usually produced and that patients frequently feel poorly rested in spite of the induced sleep. The administration frequently of hypnotic drugs to relieve tension and anxiety states does not always give satisfactory results. For instance, increased central excitability can often be observed following the cessation of barbiturate action. Furthermore, the true mental picture may be obscured or altered by such medication. Obviously there is the necessity of rehabituating patients to a more normal physiologic sleep routine, which substantially aids in the development of a more favorable alteration in mood and a reduction in tension. In many instances this objective is not satisfactorily achieved by means of sedative medication.

The advantages of employing a drug free method of caring for such states is quite obvious. Undesirable complications such as the development of drug tolerance, habituation and physical dependency and the harmful physical effects of prolonged medication need no reiteration here.

It is felt that further study along these lines is indicated and that considerable additional data could be secured by means of electrical skin resistance studies, nocturnal electroencephalograms and further blood sugar controls.

The possibility that salt reduction may potentiate the sedative action of certain drugs is being explored.

CONCLUSIONS

Twenty patients suffering from insomnia and tension states were treated by means of a salt restricted dietary regimen with the following results:

1. Pronounced or moderate relief from tension and insomnia were observed in all but 3 of the cases.

2. Controls on 13 patients revealed that 10 patients suffered relapses following the addition of salt to the diet.

3. Improvement was noted generally in the duration and regularity of sleep, with a concurrent reduction in lability and intensity of emotional response on the lower salt intake.

4. No abnormal electroencephalographic alterations followed sodium chloride reduction, and better alpha indexes were observed in those patients exhibiting clinical improvement.

5. No untoward effects were observed in patients receiving moderately restricted salt diets.

6. Improved sleep and reduction in tension was usually accompanied by lowered blood pressure, pulse rate and additional evidence of reduced sympathetic tone.

7. The actual psychiatric condition of the patients is not materially altered, except as it might be benefited by reduction in tension and improved rest.

8. The application of low sodium chloride diets as described is suggested as an important adjunct to psychotherapeutic measures in the treatment of insomnia and tension states.

TREATMENT OF ACUTE THYROIDITIS WITH THIOURACIL

PRELIMINARY REPORT

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Prior to Sept. 18, 1944 the treatment of acute thyroiditis had in our experience been unsatisfactory. On that date a young woman with the outward appearance of good health, the wife of a physician, presented herself at our office with the following history: She had enjoyed good health all her life except for diseases of childhood. She had had no recent infection. One week before, her thyroid gland had become swollen and quite sensitive to pressure. The gland was somewhat painful on swallowing. Generally she had not felt well, was more nervous, was rather irritable and had a tendency to increased perspiration. She had been more conscious of her heart action and had a moderate elevation of temperature. She thus complained of the general symptoms of a mild infectious process.

Physical examination revealed that the patient was apparently of good nutrition and good color. The only important findings were an acutely tender and swollen thyroid gland, a temperature of 99.6 F. and a white blood cell count of 9,600 per cubic millimeter with polymorphonuclears 64 per cent. Her heart, lungs and blood pressure were essentially normal. A diagnosis of acute thyroiditis was made.

It was explained to her that we knew of no satisfactory treatment for acute thyroiditis, that the disease was somewhat self limited and usually ran its course in a period of from six weeks to six months and that x-ray therapy usually shortened the course of the disease but that in our experience the patients on whom it was not used on the average wound up with a more normally functioning thyroid gland than did those on whom it was applied. We suggested that if she was willing to be the "guinea pig" we would like to try thiouracil as a therapeutic measure. She willingly assented and was told to take 0.2 Gm. of the drug three times daily. She was instructed as to its dangers and requested to have a white blood cell count every two or three days. In one week she returned stating that she was completely well and free from symptoms. That report was verified with one exception. This was that the gland had not changed in size and was still harder than a normal thyroid gland. The tenderness of the gland had disappeared, her temperature was normal and the white blood cell count was normal. The dose of the drug was reduced to 0.2 Gm. once daily and continued for two weeks. Since then she has been kept under observation for four months. The gland has returned to normal size and consistency and also to normal function.

Thinking that the result obtained might be an accident or the result of a mild type of thyroiditis, we waited patiently but hopefully for an opportunity to try the treatment on other patients with acute thyroiditis.

Material for this article was drawn from the thyroid service at King County Hospital and from private practice.

Dr. H. Sidney Newcomer and Mr. P. A. Freeman of E. R. Squibb & Sons and Dr. George R. Hazel and Mr. L. C. Beck of Abbott Laboratories supplied the thiouracil.

Before going into further detail in the report of a group of such cases, it seems fitting to discuss general considerations, previous treatment and the results obtained.

We have used iodine, rest, hot applications, ice bags and x-ray therapy. When the sulfonamide drugs came out, with the thought that acute thyroiditis was possibly an infectious process, we tried them. As well as we could determine, no benefit to the patients resulted from their use. One woman with unusually severe thyroiditis referred to us in the third week of the disease had had a temperature rise as high as 105 F. She was placed on sulfathiazole and as far as we could determine received no benefit. We have treated several other rather severe cases of thyroiditis with the sulfonamide drugs and none seemed to be benefited. We have not used penicillin, as until recently it was not available. Therefore we do not know whether it would be beneficial or otherwise.

Prior to September 1944, as previously stated, the only therapeutic agent that had definitely seemed to shorten the course of the disease was x-rays. Their use was followed in a discouraging percentage of cases by varying degrees of hypothyroidism or myxedema. No constant dosage of x-ray therapy was used, but in all cases so treated the dosage was much less than would have been indicated in cancer of the thyroid gland.

During the past twenty years, for varying reasons, we have operated on a few patients with acute thyroiditis. Cultures, both aerobic and anaerobic, of the tissues removed were made in most of the operative cases. All were negative for growth. We have not had available facilities for virus cultures and therefore do not know whether they might be positive.

We believe that biopsy cultures for the determination of the presence or absence of virus infections in a limited number of early cases of acute thyroiditis, performed by those qualified and equipped to make such studies, to be not only justifiable but a desirable experiment. In the light of our experience in the treatment of this disease by thiouracil, the proved presence of virus infection would open a field of very interesting research in the therapy of virus disease in general.

Histologically, the removed tissues showed varying degrees of inflammatory changes and evidences of destruction of the epithelial elements of the glands. Strangely, in a considerable percentage of all cases of acute thyroiditis that we have examined there was been a history of recent mouth or pharyngeal infection.

In the cases in which operation was performed, sufficient time had elapsed between the onset of the disease and the date of operation possibly to account for the absence of bacteria in the removed tissues. However, we have no evidence that they had been present at any time.

Included in this report are 7 cases of acute thyroiditis, 3 cases of migratory thyroiditis and 1 of struma lymphomatosa (Hashimoto's struma). No patients with suppurative thyroiditis, Riedel's struma or chronic inflammatory changes associated with the degenerative changes of long-standing colloid and adenomatous goiter are included, nor are the cases of toxic diffuse goiter with lymphoid hyperplasia included. Patients with "migratory thyroiditis" described by one of us [1] are included.

1. King, B. T.: Thyroiditis, West. J. Surg. 41: 391 (July) 1933.

The diagnosis of acute thyroiditis is purely a clinical one. Microscopic examination of the gland is rarely possible and the taking of a biopsy specimen entirely unwarranted from a purely diagnostic standpoint. The disease is usually of more or less sudden onset, occurring in a previously normal gland or one slightly enlarged. We have not seen it develop in a previously existing goiter of any type. It is associated with slight to moderate enlargement of the thyroid gland, which is usually quite tender and frequently painful. The gland is quite hard. Patients often complain of some pain on swallowing or turning the head. They discover that the gland is tender to touch. They complain of fatigue, lassitude, weakness, nervousness and not feeling well. The temperature usually ranges from 99 to 102 F. A few have been afebrile. The highest temperature associated with any patient we have examined was 105 F. Incidentally, this patient had the largest gland we have seen associated with the disease. The basal metabolic rate is usually slightly above normal. In none has it been above a plus 20 per cent. In many particulars the disease resembles mild hyperthyroidism and can easily be mistaken for it except for tenderness and fever. It also does not respond to Lugol's solution. Frequently there is an elevation of the number of white blood cells.

Migratory thyroiditis is no doubt the same disease as the more commonly described type of acute thyroiditis and was so designated because it varies from the usual type in one particular: It usually begins in the upper pole of one or the other lateral lobes and progresses by extension to involve the entire gland. The time required for involvement of the whole gland varies from a few days to three weeks. Prior to the present reported group of cases we had seen no case of migratory thyroiditis in which the entire gland did not become involved in the swelling and tenderness.

In 3 of the 11 cases here reported there was migratory thyroiditis, in 1 of which at the time of examination it had extended so that the entire gland was involved. In the second case of this classification the drug was not tolerated; it had to be discontinued, and the process went on to include all of the gland. Case 9 in the series was of one week's duration at the time of examination. The right lobe was more than twice the size of a normal lobe, quite apparent to casual inspection and very tender and hard. The isthmus and left lobe were normal in size and consistency and not tender. The patient had an elevation of temperature and white blood cell count plus a moderate elevation of the basal metabolism and the usual general symptoms of the disease. She was promptly given thiouracil in the usual dosage. In one week she was symptom free except for the enlarged and hard right lobe. The process had not extended to the isthmus or the left lobe. The involved lobe has now returned to a normal state in a period of four weeks. This is the only time we have seen acute thyroiditis limited to one lobe and believe it is due to the action of thiouracil.

Of the 11 cases so diagnosed and treated with thiouracil, 8 may be placed in one category. In all 8 patients the process was three weeks or less in duration. All were symptom free in one week, and in all the enlargement has completely disappeared. In case 9, 1 of those with migratory thyroiditis, the drug was not tolerated and it had to be discontinued. Little benefit resulted.

Of the remaining 3 patients who did not respond to the drug, 1 had previously been given a diagnosis of toxic goiter and had taken 10 drops of Lugol's solution three times daily for three months. The history seemed to us to warrant a diagnosis of acute thyroiditis. She has made little improvement on thiouracil and we now know that our diagnosis was incorrect.

Patient 10 had been treated five months previously with x-rays, receiving a total of 1,800 roentgens, and was past the active inflammatory stage. She still has a rather large hard gland that is quite fixed. Three weeks' treatment with thiouracil has caused no appreciable change in the condition, possibly because of the changes induced by x-rays and possibly because the acute stage of the disease is past and the structural changes in the gland are now irreversible.

Patient 11 gave a history of having been previously given a diagnosis of toxic goiter and treated with Lugol's solution 10 drops three times daily for three months. There had been no improvement in the symptoms when we examined her and the history seemed to warrant a diagnosis of acute thyroiditis. She was put on 0.2 Gm. of thiouracil twice a day for a week and then once daily for two weeks. She received no benefits and there was no change in the size of the gland. Subsequently she was operated on and microscopically proved to have Hashimoto's struma. Microscopic sections showed large areas of dense lymphoid tissue with degenerating and disappearing acini scattered throughout. There were columnar epithelial cells showing evidence of hyperplasia. We do not know whether this hyperplasia was created by the use of thiouracil for a month or whether it was a part of the original pathologic change in the gland, but the overall picture of the microscopic slides as well as the gross specimen was that of a mild degree of Hashimoto's struma. It is interesting to note that in this 1 case of Hashimoto's struma, which is the only one we have treated with thiouracil no clinical improvement took place. This fact offers additional support to the contention that Hashimoto's struma is in no way related to acute thyroiditis.

Of the 8 patients cured, 1 deserves especial mention because of certain features. This patient's symptoms were the most severe and she had the highest temperature, 102 F. at the time of our examination, the highest white cell blood count and basal metabolism rate, and the largest gland of any of the cases here reported. She stated that the temperature had been over 103 F. She had taken Lugol's solution for three weeks without benefit when referred to us. In one week on 0.2 Gm. of thiouracil three times a day she returned with the unused portion of the drug stating that she was perfectly well and was returning the medicine in the hope that we might use it with equal benefit for some other person similarly afflicted. However, she returned in another week stating that she was not so well: that the symptoms had all recurred in milder degree. Two weeks' additional treatment with smaller doses sufficed to produce a complete cure. The gland has subsequently returned to normal size and consistency and functionally appears to be normal.

CONCLUSION

If the patient is seen and treated during the early stages of the disease, we believe that for practical purposes thiouracil may be considered a specific in acute thyroiditis.

We do not know if others have used thiouracil in the treatment of acute thyroiditis and make this report in the hope that others will use it and report their experiences.

Medical and Dental Building.

PENICILLIN TREATMENT OF ACUTE PUERPERAL MASTITIS

TWENTY-FOUR CASES TREATED WITHOUT ABSCESS FORMATION

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In acute puerperal breast infections the period of cellulitis preceding abscess formation is short, and a more satisfactory treatment than incision and drainage of the resulting abscess is desirable. Although the incidence of acute puerperal mastitis is not high, the percentage going on to abscess formation is considerable. Using standard methods of treatment, McIntosh [1] showed that approximately 18.7 per cent went on to suppuration under good hospital management. Elward and Dodek,[2] McIntosh [1] and more recently Harvey, Spindler and Dowdy [3] reported a sharp reduction in the incidence of abscess formation when small doses of roentgen therapy were used. Sulfonamide therapy has apparently failed to achieve the clinical improvement expected, probably because of the relative ineffectiveness of such drugs on staphylococcic infections. Penicillin, a more energetic drug, offers a new method of treatment.

PENICILLIN AS RELATED TO ACUTE PUERPERAL MASTITIS

The bactericidal action of penicillin is selective. Among the organisms found to be particularly susceptible to penicillin are various streptococci, staphylococci, pneumococci, the clostridium group (especially Clostridium welchi and Clostridium septicum), gonococci, meningococci and, in addition, certain spirochetes and Actinomyces.[4] Bacteriologic studies have shown that most acute puerperal breast infections are staphylococcic in origin. The clinical course of acute mastitis is characterized by a variable but usually short period of cellulitis followed promptly, as the case may be, by abscess or resolution. Once an abscess has formed, penicillin will not replace adequate incision and drainage. Ambitions to limit breast infections to the cellulitis stage with penicillin therapy must involve early initiation of treatment before the lytic action of the bacteria results in suppuration, when the process becomes irreversible.

RESULTS WITH PENICILLIN THERAPY

Since August 1944, 24 patients suffering from acute puerperal mastitis have presented themselves for treatment at Fitzsimons General Hospital. The average time of onset for the group was twenty-three days post partum, while the duration of illness was at least twenty-four hours. The clinical history in each case was essentially the same: sudden onset of pain in the breast, followed shortly by chills and fever. The patients were acutely ill with temperature elevations as high as 106 F., with corresponding elevations in the leukocyte and neutrophil counts. Examination on admission revealed the involved breast to be enlarged and tender, and usually a mass was found beneath an area of erythema. Occasionally the involvement was diffuse. On admission a conservative program using intramuscular penicillin was instituted in all cases. It was quickly recognized that the usual protracted clinical course was altered. Symptomatically the patients rapidly improved. All patients were afebrile within sixty hours, and the area of induration progressively lost its tenderness and diminished in size until at the time of discharge it was seldom palpable. In several instances a small mass remained which had apparently been sterilized. Recurrence of symptoms failed to develop in any case. Abscess formation was prevented in all cases and the period of hospitalization, averaging six days, was shortened.

FIVE DAY PLAN OF TREATMENT

The course of treatment used was as follows: complete bed rest until the temperature was normal, application of ice bags, and support by breast binder. The breasts were not pumped. Penicillin was administered intramuscularly in doses of 25,000 Oxford units every three hours for seventy-two hours, then 15,000 Oxford units every three hours for forty-eight hours. If the breasts were lactating, inhibition was facilitated by using diethylstilbestrol in doses of 5 mg. three times daily until a total of 40 mg. had been given. Diet and fluids were permitted as desired. All patients were discharged between the fifth and eighth days.

COMMENT

In adapting penicillin to the treatment of breast infections an understanding of the indications, contraindications and limitations of its usefulness are essential. Several factors peculiar to this type of infection appear important.

Sulfonamide Therapy.—When there was a scarcity of penicillin there was a general tendency to use it in the treatment of infections after one of the sulfonamides had failed. For excellent reasons, sulfonamide drugs are used in the puerperal state, both to prevent and combat infectious processes, an example being the use of sulfathiazole cream for cracked and fissured nipples. Although there are no specific reports available concerning the effectiveness of sulfonamide therapy in the treatment of breast infections, undoubtedly it is widely used today. Of 16 patients treated with drugs of this group during the cellulitis stage, the last 4 patients were subsequently treated with penicillin and quickly recovered. Twelve of the patients were seen before penicillin became available, and 9 required incision and drainage of an abscess. The time per patient when incision and drainage were necessary averaged 50.7 days from the onset of the infection to complete healing of the wound. From the results obtained through its use in this small series of cases, it is our impression that sulfonamide therapy is relatively ineffective in the treatment of puerperal mastitis. Early institution of penicillin therapy, without a trial of sulfonamide administration, is desirable.

Nursing State.—Acute puerperal mastitis finds its maximum incidence during the first three weeks of the postpartum period and in relation to the weaning

1. McIntosh, Harriet C.: Roentgen Treatment of Puerperal Mastitis, M. Clin. North America **25**: 641-647 (May) 1941.
2. Elward, J. F., and Dodek, S. M.: Roentgen Therapy in Acute Puerperal Mastitis, Radiology **34**: 166-170 (Feb.) 1940.
3. Harvey, R. A.; Spindler, H. A., and Dowdy, A. H.: Roentgen Therapy as an Adjunct in the Management of Acute Postpartum Mastitis, Surg., Gynec. & Obst. **80**: 396-403 (April) 1945.
4. Penicillin, United States War Department, Technical Bulletin (TB MED 9), Washington, D. C., Government Printing Office, Feb. 12, 1944.

process. Careful supervision during these periods is important, as was recently stressed by Macpherson.[5]

A controversial question concerns the wisdom of continuing lactation after the breast infection has been controlled. With penicillin therapy it is possible to maintain lactation through and following the infection. That this is not desirable is illustrated by 3 of our patients who gave the history of having received penicillin for a minor breast infection during their immediate postpartum period. All apparently recovered and continued to nurse their babies after going home. When first seen by us approximately two weeks later, each had developed a severe mastitis in the contralateral breast, which responded well to the penicillin program herein described.

Dosage.—A factor of major importance in the treatment of staphylococcic infections in general is adequate dosage of penicillin. The staphylococcus notably becomes penicillin fast under inadequate dosage.[6] The dosage used in the present series of cases has been sufficient. Clinical remission is apparently complete in most patients after sixty hours of treatment. Hence it is felt important to continue the medication until the full course has been administered to obviate the possibility of reactivation because of bacterial resistance to penicillin. The tapering off period of 15,000 Oxford units every three hours for the last two days of treatment is good insurance against this complication.

Breast Abscess.—Systemic penicillin may be of value in cases of frank abscess formation by preventing the extension of infection to adjacent lobes. Fraser[7] reported 15 cases treated by aspiration and instillation of penicillin into the abscess cavity, with resolution without drainage in only 3 cases. He suggested using penicillin for its systemic effect at an earlier stage, feeling that local treatment offered little. Penicillin will not replace adequate incision and drainage of an abscess.

CONCLUSIONS

1. Twenty-four patients suffering from acute puerperal mastitis were treated with penicillin. All resolved without abscess formation. Eight hundred and forty thousand Oxford units was administered to each patient under a five day plan of treatment consisting of 25,000 Oxford unitis every three hours for seventy-two hours, then 15,000 Oxford units every three hours for forty-eight hours.

2. Sulfonamide therapy, because of its relative ineffectiveness, is not recommended as a substitute for early institution of penicillin treatment in acute staphylococcic puerperal mastitis.

5. Macpherson, A. I. S.: Acute Puerperal Breast Abscess: Clinical Observations on Its Etiology and Suggested Method of Treatment, Year Book of Obstetrics and Gynecology, 1944, Greenhill, Year Book Publishers, Chicago.

6. Rammelkamp, C. H., and Maxon, T.: Resistance of Staphylococcus Aureus to the Action of Penicillin, Proc. Soc. Exper. Biol. & Med. **51**: 386-389 (Dec.) 1942. Lyons, C.: Penicillin Therapy of Surgical Infections in the U. S. Army, J. A. M. A. **123**: 1007-1018 (Dec. 18) 1943.

7. Fraser, D. B.: Local Treatment of Breast Abscess with Penicillin, Brit. M. J. **1**: 523-524 (April 15) 1944.

Effect of War and Depression.—The status of the civilian changes during war to a part time soldier. Due to well entrenched habit formation, he is either consciously or unconsciously trying to lead a normal life, but at any time he may find himself the object of an attack or playing an active part in meeting enemy attack. In addition, he is constantly confronted by necessary war regulations which restrict his peacetime civil liberties.—Davis, John E.: Principles and Practice of Rehabilitation, New York, A. S. Barnes & Co., Inc., 1943.

PREVENTION OF INFECTIOUS HEPATITIS WITH GAMMA GLOBULIN

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In January 1945 Stokes and Neefe[1] published the first report of the use of human gamma globulin in the prevention of infectious hepatitis. Results indicated that this prophylactic measure was effective and that the use of this substance in infectious hepatitis compared favorably with its use in measles.

In the present report it is our purpose to describe another instance of the effective use of gamma globulin as a prophylactic measure in an institutional epidemic of infectious hepatitis. The outbreak to be described occurred in a Catholic home for children in New Haven.[2] This home had on Jan. 20, 1945 a population of 299 children (90 per cent of whom were between the ages of 6 and 16) and 39 adults. During the period between Nov. 5, 1944 and April 27, 1945, 53 cases of infectious hepatitis with jaundice and 56 cases of questionable hepatitis without clinical jaundice occurred at the home (chart 1). In the latter group of nonicteric cases the diagnosis was often somewhat indefinite. It was based on a sequence of symptoms similar to those usually found in the early stage of hepatitis with jaundice; namely, an acute onset with fever of 101-103 F., headache, nausea and vomiting. Generalized aches and pains were common, and pain in the abdomen was present in about half of these cases. The average duration of fever in these nonicteric cases was two days

TABLE 1.—*Grouping of Institutional Population*

Group	Number in Group	Basis of Selection	Inoculated
A	97	Susceptible	Yes
B	155	Susceptible	No
C	47	"Immunes" (previously ill)	No
D	39	Adults	No

TABLE 2.—*Dosage Employed*

Child's Weight, Pounds	Gamma Globulin Injected, Cc.
40- 79	5
80-119	8
120+	10

TABLE 3.—*Comparison of Rates in Groups A and B*

		Jaundice		? Hepatitis	
Group	Number	Cases	Per Cent	Cases	Per Cent
A (inoculated)	97	2	2	6	6
B (control)	155	36	23	17	11

From the Section of Preventive Medicine, Yale University School of Medicine.

This investigation was aided in part by the Commission on Neurotropic Virus Diseases, Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army, Preventive Medicine Service, Office of the Surgeon General, U. S. Army.

1. Stokes, J., and Neefe, J. R.: The Prevention and Alleviation of Infectious Hepatitis by Gamma Globulin, J. A. M. A. **127**: 144 (Jan. 20) 1945.

2. This work was made possible by the cooperation of Sister Mary Catherine Teresa and members of her staff at the St. Francis Orphan Asylum, New Haven. Dr. Joseph D'Amico of New Haven also assisted.

and they were kept in the infirmary about a week. The jaundiced patients were kept in the infirmary for two to three weeks.

There were no seriously sick patients in this outbreak. Complications were infrequent and occurred only in the icteric patients, consisting of atypical pneumonia in 1 child and generalized acute dermatitis in 2 children. One child had a relapse two and one-half weeks after discharge from his first admission to the infirmary.

Both icteric and nonicteric cases were well scattered through all the juvenile age groups represented at the institution, with no particular concentration among boys or girls. Only 1 adult contracted the disease. The institutional outbreak was coincidental with an increase in prevalence of hepatitis in the local urban population of New Haven as well as in other areas in the state of Connecticut. This was also largely a juvenile disease, for of the cases reported to the Health Department of the City of New Haven (exclusive of those at the asylum described in this paper) about 90 per cent were in children between the ages of 2 and 17 years;[3] and of the cases reported during the same period from the practice of physicians in an up state community, this same juvenile prevalence accounted for about 70 per cent of the cases.[4]

The outbreak at the institution was well under way in mid-January, when the decision to test the prophylactic value of gamma globulin was first considered. For this purpose the institution's population was divided on January 27 into four groups (table 1). Primarily, 47 children (group C) who already had had hepatitis or an illness suggestive of hepatitis were eliminated from the experiment as possible immunes. Six of these children in the latter category developed a second illness on or after January 27 with jaundice in 3 and symptoms of hepatitis without jaundice in 4. Adults (group D) also were eliminated. Of the remainder, who presumably represented the susceptible population of the institution, every second and every third child was alternately selected from the alphabetical list for inoculation, giving a ratio of about 38 per cent of the susceptibles to be inoculated. They numbered 97 children and are designated as group A. The remaining 155 susceptible children (group B) were kept as uninoculated controls.

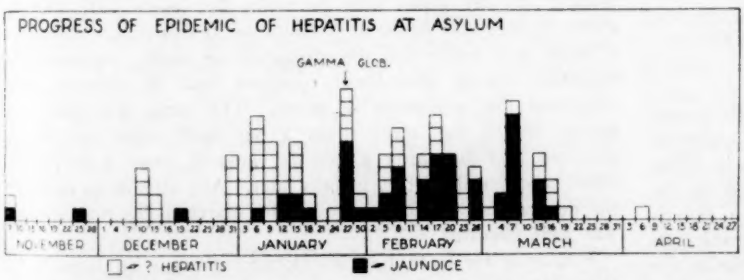

Chart 1.—The outbreak of infectious hepatitis in which gamma globulin was given as a prophylactic measure on January 27.

Gamma globulin[5] was inoculated intramuscularly on Jan. 27, 1945 into the 97 children in group A. Doses used are listed in table 2. This amount, which ranges from 0.06 to 0.12 cc. per pound, was less by 50 to 75 per cent than that used by Stokes and Neefe, who employed 0.15 cc. per pound of body weight. No untoward reactions were encountered in the 97 children inoculated.

Rates at which infectious hepatitis developed in the four groups both before and after the inoculation appear in chart 2. In the inoculated children (group A) 2 cases

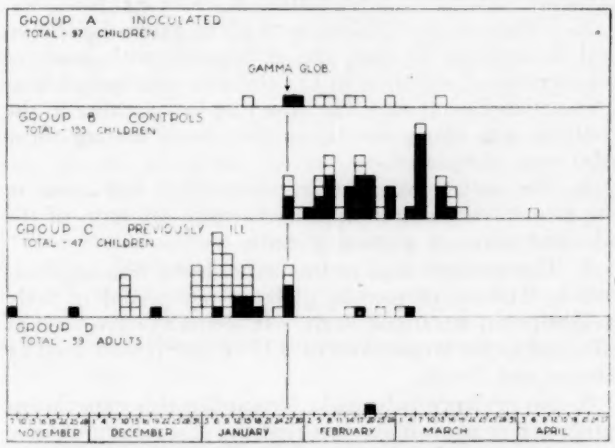

Chart 2.—Rates at which infectious hepatitis developed in four groups of children during an epidemic of hepatitis at an asylum. The open squares indicate cases without jaundice. The black squares indicate cases with jaundice.

of hepatitis with jaundice occurred within six days of the inoculation, and subsequently there were 6 questionable cases of hepatitis (without jaundice) in this group. A comparison of this result with that in the susceptible (group B) controls appears in the two upper panels of chart 2 and in the results listed in table 3. The reduction of cases with jaundice in the group inoculated with gamma globulin is statistically significant. The data do not furnish evidence either for or against the attenuation of the disease by the inoculation.

COMMENT

These results indicate a sharp difference in rate at which jaundice occurred in a group of children inoculated with gamma globulin during an institutional outbreak of infectious hepatitis as compared with a larger group of uninoculated controls in the same institution. This result was achieved in an outbreak of the juvenile form of disease, which is the common form of the disease in this country.[6]

There may be a number of different types of infectious hepatitis, which represent members of one large general group, as well as a number of varieties of the related condition known as homologous serum jaundice.[7] It is impossible to say, therefore, whether all of them would respond to the prophylactic injection of the concentrated immune bodies which are contained in gamma globulin.

Infectious hepatitis is a disease which lends itself rather well to the use of prophylactic injections in view of its long incubation period, averaging presumably about twenty-five days. This allows a period of about seventeen days after exposure in which the administration of antibodies is effective in prevention.

3. These figures are for the period of January to May 1945 and were supplied by Dr. Joseph I. Linde, health officer of New Haven.

4. Dr. James J. Derwin, Winsted, Conn., supplied these figures, which cover the period of January to April 1945.

5. The gamma globulin employed in this study was obtained through the Office of the Surgeon General, United States Army. Products of different companies were included, with lot numbers, 3-1 and 3-2, 4-1 and 4-2 for the product of company S; and A 9183 and B 647 for company C.

6. Blumer, G.: Infectious Jaundice in the United States, J. A. M. A. **81:** 353 (Aug. 4) 1923. Molner, J. G., and Kasper, J. A.: An Outbreak of Jaundice in Detroit, ibid. **110:** 2069 (June 18) 1938. Molner, J. G., and Meyer, K. F.: Jaundice in Detroit, Am. J. Pub. Health **30:** 509 (May) 1940. Norton, J. A.: Acute Infectious Jaundice, J. A. M. A. **113:** 916 (Sept. 2) 1939.

7. Paul, J. R.; Havens, W. P., Jr.; Sabin, A. B., and Philip, C. B.: Transmission Experiments in Serum Jaundice and Infectious Hepatitis, J. A. M. A. **128:** 911 (July 28) 1945.

CONCLUSIONS

1. The effectiveness of intramuscular injections of gamma globulin was tested as a prophylactic measure in an institutional outbreak of infectious hepatitis.

2. In this outbreak 53 cases of hepatitis with jaundice and another 56 cases of questionable hepatitis without jaundice occurred in a population of about 300 juveniles.

3. Ninety-seven children were given gamma globulin, and the subsequent case rate of hepatitis with jaundice was compared with that in 155 children who were left as uninoculated controls. The case rate for jaundice in the controls was about ten times that noted among those who were inoculated.

4. The only 2 cases of jaundice which did occur in the inoculated children appeared within six days of the administration of gamma globulin.

5. The average dose in this experiment was approximately 0.08 cc. of gamma globulin per pound of body weight given intramuscularly. It seems to have been as effective as the larger dose of 0.15 cc. per pound used by Stokes and Neefe.

6. No evidence is brought forward in this experiment either for or against the fact that the disease might have been attenuated by the injections.

7. It appears that gamma globulin is an effective prophylactic measure against infectious hepatitis when given in the incubation period, preferably earlier than six days before the onset of symptoms. This last statement is based on the study herein reported and on the original observations of Stokes and Neefe.

ADDENDUM

Since this paper was accepted for publication, another and similar report by Gellis, Stokes and others [8] has appeared. In it the results of a study carried out among troops in the Mediterranean theater in the fall of 1944 are listed. With a dose of gamma globulin of 10 cc. per man (about half that originally used by Stokes and Neefe) success in preventing infectious hepatitis was achieved.

Clinical Notes, Suggestions and New Instruments

COLCHICINE IN ACUTE MYELOGENOUS LEUKEMIA

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The effect of colchicine in arresting mitosis of both animal and plant cells has long been known. As would be expected, rapidly growing malignant tissue is more susceptible to its effect than normal tissue. Many investigators have reported on the effect of colchicine on tumor tissue in culture and in experimental animals. On the basis of this effect on malignant cells in vitro, Dr. O. H. Perry Pepper suggested colchicine in the case of acute myelogenous leukemia herewith reported. He had tried it in 2 acute cases, in 1 of which it had no apparent effect. In the other there was a complete remission, such as sometimes occurs spontaneously, whereupon the drug was discontinued. When relapse occurred the drug was resumed, but the further course of the disease was as would have been expected without the drug.

Two references to the use of colchicine in leukemia were found in the literature. Bernard [1] gave 1 mg. of the drug by injection into the marrow twice a week in a case of acute myelogenous leukemia for a total of six doses, whereupon the patient died. There was apparently some modification of the blood picture but not of the course of the disease. In the other case,[2] of chronic myelogenous leukemia, the drug was administered by mouth without benefit.

In the case reported here, when colchicine was begun the disease was acute and the symptoms were of short duration. The progress of the disease soon became less rapid, then favorable. For some months the patient showed the picture of an aleukemic leukemia (though still with a preponderance of very young forms). After losing 58 pounds (26 Kg.) there was progressive gain in weight and strength before she finally slipped into the terminal state of the disease. Colchicine was continued through the course of the disease, certainly without harmful effect and perhaps with actual though temporary benefit. The spleen was not apparently enlarged until shortly before death and then was only 1 cm. below the costal margin, nor was the white blood cell picture what would have been expected if the disease had changed from the acute to the chronic form.

REPORT OF CASE

Mrs. B. N., aged 55, about Dec. 20, 1943 began to notice irregular fever, malaise, painful swollen gums and submental and cervical adenopathy. She had had a slight tendency to spontaneous subcutaneous hemorrhage all her life (a tendency apparently inherited by her daughter). For six months before the symptoms developed, this tendency was slightly, but increasingly, more evident than before.

Blood counts had been done at various times during the preceding ten years and no abnormal findings noted. The last previous one was eight months before, and this showed white blood cells 3,500, polymorphonuclears 85 per cent, lymphocytes 15 per cent.

Examination a few days after onset showed decidedly swollen, spongy and tender gums, and cervical adenopathy, together with swelling and tenderness of the submental and parotid lymph nodes. The spleen and liver were not enlarged, and the examination was otherwise essentially negative except for several subcutaneous hemorrhages.

On December 27 the blood showed hemoglobin 11.2 Gm., 67.5 per cent, red blood cells 3,960,000, white blood cells 29,000, with 95 per cent myeloblasts and promyelocytes. A diagnosis of acute leukemia was made. (This and all subsequent counts were done by Dr. Thomas A. Cope Jr.) A count on December 30 showed white blood cells 52,700, with 83 per cent myeloblasts and promyelocytes. On Jan. 10, 1945 the hemoglobin had dropped to 8.2 Gm., 49.5 per cent; red blood cells 2,950,000. The white blood cell count had risen to 110,400, with 90 per cent myeloblasts and promyelocytes. The patient was becoming weaker and her gums were bothering her more. Dr. O. H. Perry Pepper was called in consultation at this time. He made a slide and confirmed the diagnosis of acute myelogenous leukemia, noting the almost complete lack of platelets, and suggested that colchicine be given. This drug was given in tablets of 0.5 mg. three times a day until there was some diarrhea, and then after a two day interval twice a day, until death supervened thirteen months later. Any attempt to increase the dosage seemed to be followed by diarrhea, but this dosage was well tolerated.

Following the institution of colchicine therapy on January 11 the white blood cell count rose on Jan. 20, 1944 to 145,000, with 51 per cent myeloblasts and promyelocytes and 29 per cent myelocytes. On February 14 the blood count showed hemoglobin 6.1 Gm., 37 per cent; red blood cells 1,880,000, white blood cells 4,900, myelocytes 10 per cent, stabs 22 per cent, segmented 43 per cent, lymphocytes 25 per cent. The mouth and the lymph nodes were immensely better. The fever was nearly gone, and the patient felt greatly improved, though weak. Two blood transfusions totaling 750 cc. helped to improve the anemia. On March 4 the blood showed hemoglobin 9.9 Gm., 60 per cent; red blood cells 3,660,000, white blood cells 2,400, myelocytes 10 per cent, stabs 6 per cent, unidentified

8. Gellis, S. S.; Stokes, J., Jr.; Brother, G. M.; Hall, W. M.: Gilmore H. R.; Beyer, E., and Morrissey, R. A.: Use of Human Immune Serum Globulin (Gamma Globulin) J. A. M. A. **128:** 1062 (Aug. 11) 1945.

1. Bernard, J.: Leucémie aiguë: Essai de traitement per les injections intramédullaires de colchicine, Sang **13:** 434, 1939.

2. Paul, J. T.; Brown, W. O., and Limarzi, L. R.: The Effect of Colchicine on Chronic Myeloid Leukemia, Am. J. Clin. Path. **11:** 210, 1941.

cells resembling lymphocytes 84 per cent. The patient was able to be up and dressed every day at this time. Further blood transfusions of 500 cc. each were given once each in March, April and May. The mouth no longer bothered her. Her teeth, however, were still somewhat loose. In March, following cleansing by an otologist, there was bleeding from one ear which was hard to control. There was also severe dysphagia for some days, probably from a deep hemorrhage, though no lesion was found. On April 19 she was suffering much pain from an inflamed ulcerated hemorrhoid. The white blood cells at this time numbered 17,700, with 87 per cent myeloblasts and promyelocytes. On May 9 the blood showed 27,600 white blood cells, with 95 per cent myeloblasts and promyelocytes. Then a mass of glands in the right axilla developed and suppurated, being first ready for aspiration on May 20. The bleeding tendency rendered incision unsafe. The pus showed nonhemolytic Staphylococcus aureus. At this time the white blood cells numbered 76,900, with 98 per cent myeloblasts and promyelocytes. Blood transfusion was given two days before the abscess was aspirated and seemed to help in the suppuration. On June 19 the white blood cells numbered 31,800, with 90 per cent myeloblasts and promyelocytes. On August 9 the white blood cells numbered 10,900, with 37 per cent myeloblasts and promyelocytes. On August 14 cellulitis developed inside the right nostril, with swelling of the face. This was controlled with the help of penicillin. Later in the month an ischiorectal abscess developed and ruptured spontaneously, with pus containing a hemolytic streptococcus and blood clots. Penicillin was not given for this.

In September the weight of the patient had dropped from 138 to 80 pounds (63 to 36 Kg.), but she felt fairly well. Her teeth, which had been loose, were now firm and her gums were normal. Fever was no longer present. The weight and strength steadily improved during the next three months, so that she regained 15 pounds (7 Kg.). There were two further episodes of infections, a paronychia which required penicillin and another pararectal abscess, which was also treated with penicillin and which ruptured spontaneously. No transfusions were given after May, but on November 17 hemoglobin was 10 Gm., 61 per cent, red blood cells numbered 3,470,000, white blood cells 7,300, myeloblasts 46 per cent, stabs 2 per cent, prolymphocytes 5 per cent, lymphocytes 15 per cent.

In the latter part of December 1944, a year after onset of acute symptoms, the patient developed nausea and anorexia, which persisted until death. It was suspected that hidden purpuric hemorrhage was a factor in this. More subcutaneous hemorrhages were noted, and she began to pass bloody urine about Jan. 18, 1945. The blood count on January 22 showed hemoglobin 6.5 Gm., 39 per cent, red blood cells 3,160,000 and white blood cells 90,200, of which 90 per cent were myeloblasts and promyelocytes. Transfusion of 500 cc. was given on January 23, but bleeding continued. This was the first transfusion since May. The blood count on January 29 showed hemoglobin 7.5 Gm., 45 per cent, red blood cells 3,170,000, white blood cells 162,000, myeloblasts and promyelocytes 81 per cent, myelocytes 9 per cent. Another blood transfusion of 500 cc. was given on February 1. Hematuria ceased two days later. Then for a week there was no bleeding, but hematuria recurred and continued until the day before death. There was also a nosebleed, which was controlled by packing once with epinephrine. The blood count on February 13 showed hemoglobin 5.5 Gm., 33 per cent, red blood cells 2,500,000, white blood cells 295,000, myeloblasts and promyelocytes 93 per cent, myelocytes 4 per cent. Further transfusions seemed useless, the rapid rise in the white count apparently being the terminal outpouring of these cells. Slides were examined by Dr. L. M. Tocantins on February 16, who reported "There were great numbers of leukocytes, a great majority of which were primitive cells (probably myeloblasts); some of these cells had Auer bodies. No platelets were seen in this smear. The red blood cells were slightly larger than normal. The blood changes are those observed in the terminal acute stage of a myeloid leukemia." The patient became progressively weaker; cachectic edema developed, and on February 24 she lapsed into coma, dying a few hours later. No autopsy was performed.

SUMMARY

Colchicine was administered to a patient with acute myelogenous leukemia and continued until death thirteen and one-half months later. The condition did not proceed to its usual rapid termination, nor did it assume the typical characteristics of chronicity. The downhill course gradually slackened through eight months, and after a weight loss of 58 pounds (26 Kg.) there was a three month period of improvement during which 15 pounds (7 Kg.) was regained. Transfusions were unnecessary for an eight month period. The course of the disease was punctuated by the usual pyogenic infections, three of which required penicillin and three of which suppurated. A probable lifelong thrombocytopenia was apparently accentuated by the leukemia. There was nothing unusual about the terminal clinical and hematologic picture. No conclusions can be drawn regarding the beneficial effect of colchicine in this case, but further trial of the drug for the condition seems justified.

8801 Crefeld Street.

RECURRENCES OF PNEUMOCOCCIC MENINGITIS

EUGENE F. TRAUT, M.D., CHICAGO

Craddock and Bowers [1] described a patient having repeated attacks of pneumococcic meningitis. The patient of Hopkins and his co-workers [2] had three acute episodes of sinusitis complicated each time by pneumococcic meningitis. Recovery followed sulfonamide medication and treatment of the sinusitis.

The patient who is the subject of the present report has been under the care of Dr. E. W. Westland in the West Suburban Hospital. When first seen she was 7 years old and had always been well since an uncomplicated skull fracture two and one-half years before. Within four years she has been admitted to various hospitals for five acute attacks of pneumococcic meningitis. The organism isolated from the spinal fluid in three attacks has been type XXI. There is no known focus in the ears, respiratory tract or the accessory sinuses. X-ray examinations of the lung, skull and sinuses have been negative. In each recurrence the episode has been primary, uncomplicated by involvement of any other part of the body. In each attack the patient has responded to sulfonamides and antipneumococcus serum. The symptoms have always been violent with coma, convulsions, headache, high fever and vomiting of sudden onset.

The meningitis in each instance has recurred suddenly and violently. Within five hours after a rigor, headache and projectile vomiting she is in coma with convulsive seizures. The leukocyte count in the blood and spinal fluid rises swiftly. The spinal fluid sugar falls. Responding rapidly to type specific antipneumococcus serum and small intravenous doses of sulfonamides, she soon recovers. In her third attack she was treated in a small hospital with limited laboratory facilities. She received no serum but recovered after small doses of sulfonamide. In her fifth episode she was treated in the Michael Reese Hospital by Dr. Abraham Levinson. On this fifth admission the pneumococci in the spinal fluid were reported to be type XV. She recovered after sulfonamide had been administered for two days.

Between her first and second attacks she was apparently well for three months; between the second and third attacks, six months; between the third and fourth attacks, eleven months, and between the fourth and last attack, twelve months. The increasing intervals may indicate a rising resistance.

1. Craddock, G. B., and Bowers, R. V.: Recurrent Pneumococcic Meningitis Treated with Sulfapyridine, J. A. M. A. **116**: 296 (Jan. 25) 1941.

2. Hopkins, H.; Hatch, L. C.; Schenk, H. P., and Pepper, D. S.: Recurrent Pneumococcic Meningitis Treated with Sulfonamides, Ann. Int. Med. **20**: 333 (Feb.) 1944.

The parents of the child refuse to return her for determination of a possible further study of her spinal fluid to determine the possibility of persisting pneumococci in the spinal fluid. It has been suggested that pneumococci may be constantly present in the patient's spinal fluid without giving rise to inflammation or symptoms analogous to bacteriuria without pyuria.[3]

122 South Michigan Avenue, Chicago 3.

THE TREATMENT OF PERIRENAL ABSCESS WITH PENICILLIN

MAJOR E. A. OCKULY, CAPTAIN W. T. BARNHART AND CAPTAIN H. L. EGBERT
MEDICAL CORPS, ARMY OF THE UNITED STATES

A private aged 30 had been in Africa eleven months at the time of his first hospitalization, which occurred on Sept. 4, 1943 because of malarial fever, estivoautumnal type; acute bronchitis, and chronic acne of a moderately severe nature over the shoulders and thoracic portion of his back. He was discharged to duty as cured of his malaria and bronchitis but without improvement of the acne on Sept. 13, 1943.

He was readmitted to the same hospital in Africa on three occasions after this because of recurrent malaria. These admissions were between Sept. 28, 1943 and Dec. 3, 1943.

During hospitalization following the third admission he continued to have a low grade fever of 99 to 100 F. even though his blood smears were repeatedly negative for plasmodia. He was discharged from the hospital on Jan. 31, 1944, his temperature still varying between 99 and 100 F.

Readmission was necessary on Feb. 4, 1944 because of fatigue, malaise, anorexia, nausea, vomiting and upper abdominal pain. Blood smears for malaria were repeatedly negative, the urinalyses were normal and the blood count showed a normal differential with 9,050 white blood cells and 5,670,000 red blood cells. Agglutination tests for typhoid, typhus, paratyphoid A and B and melitensis were negative. The sedimentation rate was 7 mm. in one hour. Roentgenographic gastrointestinal examination was normal except for pronounced hyperperistalsis. X-ray of the chest and routine examination of the stool were normal. Continuing the low grade fever, he remained in the hospital until April 8, 1944, at which time he was transferred to the United States.

On his way to the United States he was taken from the plane in Puerto Rico and hospitalized one day because of pain in the midportion of the upper abdomen, nausea and vomiting. His temperature was 99.2 F. at the time of his admission and he was released from the hospital twenty-four hours later.

In the United States he remained in a hospital from April 15 to June 17, 1944. Medical, dental and neurologic as well as repeated blood, stool and urine examinations were normal. During this hospitalization he had developed a large furuncle on the dorsum of the lower third of the left thigh, which spontaneously opened, drained and healed under the application of hot moist packs. His temperature during this stay in the hospital varied from normal to 99.4 F.

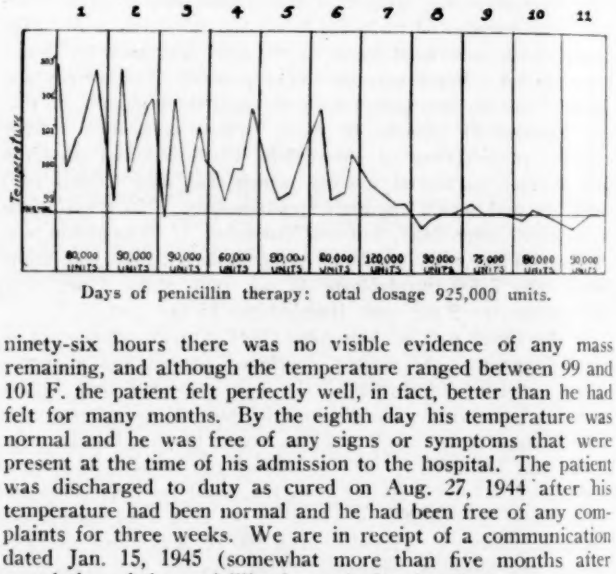
After a furlough he entered a redistribution station on July 4, 1944 for reprocessing and reassignment. Beginning July 15 he noticed soreness in the left costovertebral angle, which would awaken him at night and for which he would usually get out of bed, walk around and take a smoke in an attempt to be more comfortable. He stated that he was very weak, that slight exercise would produce a very coarse tremor of his hands, and night sweats were a regular occurrence.

On July 20 he had a severe chill, nausea, vomiting and an increase of the continuous aching in the left costovertebral angle. He was admitted to the A. A. F. Regional Station Hospital at Coral Gables, Fla., July 21. His temperature was 103 F., there was severe pain in the left upper abdomen and back, and an admitting diagnosis of recurrent malaria was made. Repeated blood smears were negative for malarial parasites. Because of the persistent pain in the left costovertebral angle and fever of from 99 to 103 F., he was seen in consultation by the urologic department on July 28. He had been treated with sulfadiazine from July 24 to July 28 with no improvement in the pain or his fever. There were no urinary symptoms.

At the time of examination the temperature was 102.8 F., he appeared moderately anxious, his tongue was coated and the examination showed that there was muscle guard and tenderness to palpation over the left kidney. A questionable mass could be felt in the left upper abdomen, but because of the muscle guard this could not be definitely established. However, there was visible bulging in the area of the left costovertebral angle and this was decidedly tender. A diagnosis of left perirenal abscess was made. The intravenous urograms revealed an obliteration of the left psoas shadow and a mesial displacement of the upper third of the left ureter with otherwise normal pyelograms and evident good bilateral renal function. The urine was normal except for an occasional pus cell, the white blood cell count was 14,000 and the blood sulfadiazine level was 8.2 mg. per hundred cubic centimeters.

Continuous intravenous penicillin therapy was administered at the rate of 60,000 to 125,000 units every twenty-four hours. His temperature gradually dropped to normal over a period of eight days. The penicillin therapy was continued for two days after the temperature was normal, until a total of 925,000 penicillin units had been administered.

Within forty-eight hours after starting the penicillin therapy the patient felt very much better, muscle guard over the upper abdomen disappeared and there was definite diminution in size of the tender mass in the left costovertebral angle. After



Days of penicillin therapy: total dosage 925,000 units.

ninety-six hours there was no visible evidence of any mass remaining, and although the temperature ranged between 99 and 101 F. the patient felt perfectly well, in fact, better than he had felt for many months. By the eighth day his temperature was normal and he was free of any signs or symptoms that were present at the time of his admission to the hospital. The patient was discharged to duty as cured on Aug. 27, 1944 after his temperature had been normal and he had been free of any complaints for three weeks. We are in receipt of a communication dated Jan. 15, 1945 (somewhat more than five months after completion of the penicillin therapy) showing that no symptoms referable to a possible recurrence have appeared.

Although we have no proof that free pus was present, all the classic clinical symptoms and findings of perirenal abscess were present. Except for the desire to exploit the value of penicillin, there was no doubt in our minds that incision and drainage were indicated at the time penicillin therapy was begun.

As far as we know, this is the first case treated and cured with penicillin therapy. It naturally provides the interesting speculation that perhaps another heretofore surgical condition has become, in at least certain selected instances, amenable to chemotherapy.

3. Herrold, R. D.: Personal communication to the author.

The Average Length of Life.—The average length of life in India is only twenty-seven years, whereas that for Japan is forty-six years, for Great Britain sixty-two years and, for the United States, approximately sixty-two years. Yet, in spite of such high mortality rates and the short length of life, India's population has increased by more than 250,000,000 in the past ninety Years.—Simmons, James S., and others: Global Epidemiology, Philadelphia, J. P. Lippincott Company, 1944.

Special Article

THE ORGANIZATION AND RESULTS OF HEALTH MAINTENANCE-CANCER PREVENTION CLINICS

MILDRED W. S. SCHRAM, PH.D.
Secretary, International Cancer Research Foundation
PHILADELPHIA

In view of the findings in three cancer prevention clinics which have been in operation for from four to seven years, the International Cancer Research Foundation has established in the city of Philadelphia a series of clinics for the conservation of health. This has been done for a five year period on an experimental basis. It might be dubbed a five year plan or even a "noble experiment." In any case Philadelphia will be the laboratory in which data will be gathered on which may be based valid conclusions as to the future of such examining centers. That they are essential to the good health of the nation may be considered as hardly open to question in view of the findings at Selective Service examinations and at recent examinations of school children in Philadelphia. Figures of the latter are sufficiently arresting to warrant quoting here. Of 170,260 pupils examined 68,823 were found normal. Only 40 per cent! Doesn't that give one pause?

Be that as it may, the objective of the present experiment is to provide adequate data for statistical evaluation. Present indications are that there will be about twenty-five hundred examinations a year. From a research point of view, much of the ultimate value of these clinics will be the data accumulated over the years. To this end, especial care has been given to preparation of the forms. All clinics are requested to use these forms to insure uniformity of data.

The clinics do not give treatments. Their one function is examination, with special emphasis on conditions which may lead to cancer. Complete physical examinations are given, including the skin, mouth, tongue, pharynx, larynx, breast, pelvis, rectum and lymph nodes, routine laboratory tests—blood count, urinalysis and Wassermann-Kline tests—and a routine chest film. When special studies are indicated, e. g. cystoscopy, biopsy, or gastrointestinal series, these will be done wherever the examinee or his physician desire.

Whenever there is a positive finding, the examinee is referred back to his physician. If he has no physician he is given a list of names of physicians in his vicinity. If he cannot afford a physician he is given the names of several hospitals, from which he will make his choice. When medical attention of any kind is indicated, a letter is sent to the personal physician noting the findings and advising as to consultation or whatever is relevant. Should the condition be urgent there is a follow-up telephone call within a week or two. If the condition is not serious the follow-up may be deferred for some weeks. A record is kept of what treatment is administered, where, when and by whom. Records will be available to all personal physicians and also, eventually, for studies by those qualified to undertake them.

Read by invitation before the Philadelphia session of the American College of Physicians, Dec. 14, 1944.

If the examinee cannot afford to make the usual contribution toward the expenses of the examination, this is adjusted to his ability to pay. Should special studies be required for which he is unable to pay, the foundation will reimburse the institution concerned for the cost of such studies.

ORGANIZATION

The first requisite in undertaking the organization of health maintenance-cancer prevention clinics is enlisting the interest and the cooperation of the county medical society and the hospital in which the clinic is to be held. This having been accomplished, details of procedure and function are next to be considered. A usual query, not infrequently so worded that it becomes almost an objection, is "But how can it be done with the present shortage of physicians and nurses?" The answer is, Yankee-fashion, "Can you not find in your institution one physician who is willing to give two hours a week for this service, or two physicians each of whom will give two hours every other week? And a nurse who will give three hours each week (or, similarly, two nurses to alternate in giving three hours weekly)? That will staff your clinic." It will be a small one, surely; but is it not better to serve a few each week—even 2 a week means 100 a year—than not to start at all? And this much may be said: Once a beginning is made, "it shall follow as the night the day" that the proverbial snowball will have started rolling.

In addition to the physician and the nurse, there will be needed a laboratory technician and the services of the x-ray department to take the routine chest film. If equipment for taking small films is available these suffice, since these routine films are for screening purposes only. If anything suspicious is found, the examinee is referred to his physician for further x-ray studies. You notice that the word "examinee" is used rather than the word "patient." This is done advisedly, since these examining centers are not for those who are ill. They are intended for well folk only. No appointment is given to any one who is under treatment unless his physician sends a written request. Neither are appointments made for children.

As to procedures, these may vary from hospital to hospital. The obvious questions are "Where to hold the clinic? What about the laboratory work?" About location: Our five months' experience indicates that it is decidedly advantageous to hold the clinic within easy reach of the x-ray department. This minimizes confusion and loss of time—and, sometimes, loss of examinees. That is literally true. It "did happen here."

The space that appears best adapted to these examinations seems to be the obstetric or gynecology outpatient department. Here there are scales, small tables to be used while taking the histories, and examining tables.

As to the laboratory technician, having her come to the clinic is by far the most satisfactory as well as the most efficient arrangement.

Any details concerning the examining physician's duties would be superfluous here. Suffice it to say that emphasis is placed on care and thoroughness, however time consuming. In the beginning, the schedule is one examinee per hour. As experience and facility increase,

three examinations can be done in the clinic period of two hours. Under unusually favorable circumstances, when the examining physician is especially able, four are completed without difficulty. When the six month period is up and reexaminations begin, I understand that twice as many can be done in a given time. I cannot speak of this from experience, since our clinics are not yet six months old.

As the number of examining physicians increases, it becomes advisable to have one senior examiner, or supervisor, to whom questions can be referred and who assumes responsibility as to technicians, care of charts and disposition of cases.

The hospital which provides the space also arranges for the services of the nurse. She is paid by the hour. She comes sufficiently in advance of the hour of the clinic to see that examining rooms are in order and to check necessary supplies and equipment, such as the gynecologic tray, the otoscope and the laryngeal mirror. She takes temperatures and weights and gets the examinee ready on the table. Her final responsibility is to leave the room in order. Our experience is that one-half hour before and one-half hour after the clinic suffice.

In order to minimize waiting on the part of the examining physician, the examinee is asked to report three quarters of an hour ahead of the hour scheduled. Thus, for a 4 o'clock clinic he is asked to come at 3:15. This allows time for him to go to x-ray, to make his contribution, to register, to report to the laboratory technician, to be weighed. Also he fills in his "information blank" before the examining physician arrives. This mimeographed copy of the face sheet is given him as soon as he arrives, with the request that he fill in all the spaces and do this between times while he is waiting at x-ray or elsewhere. Some one in charge is careful to check over these sheets before the examinee leaves to make sure that all the information that has been requested is given.

CONDUCTING THE CLINICS

Meeting, registering and steering the examinees, and helping them with the face sheets are minor but important details in the functioning of these clinics. In the hands of gray ladies, nurses' aides or other volunteers they are accomplished with tact and skill.

When the examining physician finds anything which requires medical or surgical care, the usual procedure is for him to tell the examinee to get in touch with his physician in ten days or two weeks. One may ask "Why not sooner?" The reason is simple. Laboratory and x-ray reports are subject to delay, especially under present conditions. Accordingly the practice has been adopted of collecting the charts and their laboratory and x-ray findings one week after the examination. Thus charts and findings of examinations made today will be called for and taken to the clinics office one week from today.

In the clinics office the charts are copied and the laboratory and x-ray reports are entered in their proper places. Then, if the examinee is to be referred to his physician, a letter is written and a mimeographed postcard enclosed for the latter's reply. Two carbons are made of each letter. Thus there are two complete sets of each examinee's record. The carbon copy is filed in the central office, the original, with all report slips attached, in the hospital in which the examination was made.

As to record keeping, a 3 by 5 white index card is made for each examinee. On this are entered the date of the examination, the code letter of the institution in which the examination was made, the name of the examinee's physician and the date on which a letter was sent to him; and space is left for the date on which he reports to us.

Another 3 by 5 index card is typed, this one with the name, address and telephone number of the physician to whom an examinee is referred. The name of the examinee also is given. When reports are received the date, the examinee's name and the substance of the report are entered on the back of the card. Two colors are used for the physician's cards: one is buff, for the usual; the other, aqua, for cases such as dilation and curettement or biopsy, on which an early report is desired.

Before it is filed, each card is flagged to indicate when it is to receive attention. The color of the flag tells us when a reply from a physician is overdue and when an examinee should be notified concerning his next examination.

In addition there is the index file of positive findings. Each chart is carefully checked and the examinee's name entered on the appropriate card or cards. This makes it possible to determine, almost at a glance, the number of cases of, for instance, cervicitis, which have been encountered to date, in which clinic the examinee was seen and the sex.

Nothing has been said concerning appointments. Item one here might be that for some weeks the entire time of one office girl was required to answer the telephone. Within ten days after the announcement that the clinics were to be opened, and before any was in operation, all of them were booked to capacity for six months and there was a considerable waiting list. With appointments made so long in advance, postcard reminders were indicated. These are sent well in advance. The present waiting list is uncounted hundreds. There are those who fail to appear for examination but do not cancel the appointment. This is unfortunate, because many are waiting. Therefore, in order to hold an appointment, the examinee is asked to send check or money order for $2. If this is not received by a specified date, it will be assumed that he does not wish the appointment, and the hour is assigned to some one on the waiting list. The remainder of the contribution is made at the clinic.

So much for the first part of my subject. There are now eight clinics a week in Philadelphia, and plans for more are pending. One was opened in the Falk Clinic in Pittsburgh in early November. Others are in process of organization in various states.

RESULTS OBTAINED

Up to December 1, that is, in just under five months, a total of 919 examinees have been seen, 176 men, 743 women. Of these, 111 men and 493 women were referred to physicians; 3 men and 9 women, who were unable to pay for private medical care, were referred to clinics. Of the 604 physicians who received reports of positive findings, 287 have replied. The replies show that (1) 14 men and 36 women failed to see their

physicians; (2) 4 men and 26 women were referred to specialists by their personal physicians; 7 men and 48 women postponed having treatment; the remainder of these persons were under treatment, or treatment has been completed.

Of the first 1,065 examined, there were 15 men and 96 women between 19 and 30, 42 men and 290 women between 31 and 40, 76 men and 285 women between 41 and 50, 48 men and 147 women between 51 and 60, 13 men and 51 women between 61 and 75 and 2 women of 76 or over.

In the 616 who were referred for medical or surgical care, positive findings include 9 malignant lesions: in men, 1 of the colon, 1 of the prostate; in women, 2 of the fundus of the uterus, 1 of the gallbladder, 1 of the cervix, 1 of the peritoneum, 1 of the breast and 1 epithelioma of the skin. Including biopsies requested, there were 48 suspected malignant lesions, 6 in men, 42 in women. Biopsies were requested for 1 man and 28 women. Sixteen dilations and curettages were requested.

Other positive findings include 239 cervical lesions, 177 cardiovascular diseases, 138 skin lesions, 110 hemorrhoids, 77 varicosities, 67 cystoceles, 64 rectoceles, 33 gastrointestinal disturbances, 27 hernias, 20 papillomas, 11 fibromyomas, 8 myomas, 8 lipomas, 3 fibromas of the uterus and 4 unclassified benign tumors. The teeth required attention in 34 cases and the feet in 88.

COMMENT

Perhaps a word should be added as to the christening of these examining centers. The name used is admittedly heavy and cumbersome. But I submit that if their name is to indicate their purpose it can't be short. Try a few alternatives, such as "periodic health examinations with emphasis on conditions which may lead to cancer," or "diagnostic clinics with emphasis on cancer prevention." You can go into solitary confinement and play around with words and synonyms and rearrangements for a week and still come up with a mouthful. If any one can do otherwise, more power to him.

It may be that you have heard echoes of a debate as to terminology—possibly you've heard the terms "cancer prevention" and "cancer detection" used and abused, cussed and discussed. Far be it from me to enter such a controversy; but it may be noted (1) that we don't want to wait until a cancer is there to be detected—we want to catch its forerunner, as far as this may be possible, and (2) that it is generally agreed (as was mentioned in this city a few days ago) that removing keratoses from 100 individuals means that those 100 will not have cancers in the keratotic areas. Similarly with certain nevi.

In my opening sentence reference was made to the desirability of the interest and cooperation of the county medical society and the hospital which provides space for the clinics. These are of the essence. And I cannot close without a word of appreciation to the Philadelphia County Medical Society and the several hospitals concerned in the launching of this vital public health service. Such success as it has enjoyed is due in no small measure to their enthusiastic support and superb cooperation.

Lincoln-Liberty Building, Philadelphia 7.

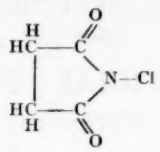
Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

AUSTIN SMITH, M.D., *Secretary.*

SUCCINCHLORIMIDE. — N-chlorosuccinimide. — The chlorinated imide of succinic acid.—$C_4H_4O_2NCl$.—M. W. 133.54. Succinchlorimide yields not less than 25.0 per cent nor more than 26.6 per cent of active chlorine.



Actions and Uses.—Succinchlorimide is proposed for use in disinfection of water. Data were submitted showing that succinchlorimide will disinfect water containing Escherichia coli, Eberthella typhi, Salmonella paratyphi A and B, Vibrio cholerae and Shigella dysenteriae within twenty minutes in dilution of 11.6 parts per million (approximately 1: 100,000).

Dosage.—For the disinfection of water, 11.6 mg. of succinchlorimide per liter.

Tests and Standards.—

Succinchlorimide occurs as a white to yellowish white powder possessing a relatively strong odor of chlorine. It is sparingly soluble in benzene and in chloroform; slightly soluble in ether. Its solubility in water approximates 1.6 Gm. per hundred cubic centimeters at 25 C. The *p*H of a saturated aqueous solution of succinchlorimide is about 4.0. Succinchlorimide begins to sublime at about 127 C. and melts at from 147 to 150 C.

Although it appears to be relatively stable toward light and air at ordinary temperatures, succinchlorimide should be packaged in air tight, light resistant containers.

Place a few crystals of succinchlorimide in a test tube and add 2 cc. of sodium iodide solution and 1.0 cc. of chloroform: a purple color develops in the chloroform layer.

To 5 cc. of a saturated aqueous solution of succinchlorimide, acidified with diluted sulfuric acid, add 5 cc. of ethyl acetate and 1.0 cc. of sodium thiosulfate solution. Shake the mixture vigorously for a short time and transfer the layer of ethyl acetate to a watch glass; evaporate the ethyl acetate slowly to dryness and collect the resulting white residue: the succinimide obtained melts at 124 C. Heat a small amount of the succinimide obtained with ten to twenty times its amount of zinc dust contained in a test tube. When distillation begins, place a pine splint which has been soaked for thirty seconds in hydrochloric acid in the fumes: a red color develops in the splint.

Ignite about 2.0 Gm. of succinchlorimide, accurately weighed, until it is charred. Moisten the residue, after cooling, with a few drops of sulfuric acid and reignite to constant weight: the residue is not more than 0.15 per cent.

Dissolve about 0.15 Gm. of succinchlorimide, accurately weighed, in 100 cc. of water contained in an iodine flask. Add 3 Gm. of potassium iodide and 10 cc. of dilute sulfuric acid. Stopper the flask, seal the stopper with a known amount of tenth-normal sodium thiosulfate solution and allow to stand five minutes with occasional swirling. Loosen the stopper, allowing the thiosulfate solution to run into the iodine flask; wash the stopper and neck of the flask with 5 cc. of carbon tetrachloride followed by water, and titrate with more tenth-normal sodium thiosulfate to the disappearance of color in the carbon tetrachloride layer. As the end point is approached it is necessary to stopper the flask and shake it frequently and vigorously, with care to avoid loss of contents. Each cubic centimeter of tenth-normal sodium thiosulfate is equivalent to 0.001773 Gm. of active chlorine. The active chlorine content of succinchlorimide is not less than 25.0 per cent nor more than 26.6 per cent.

NATIONAL ANILINE DIVISION, ALLIED CHEMICAL & DYE CORP., NEW YORK

Succinchlorimide: Bulk.

GLOBIN INSULIN WITH ZINC (See Supplement to New and Nonofficial Remedies, 1944, p. 31).

The following additional dosage form has been accepted:

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Globin Insulin with Zinc: 10 cc. Each cubic centimeter contains 40 units; 0.18 per cent W/V cresol as preservative.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, SEPTEMBER 22, 1945

OFFICIAL CALL

To the Officers, Fellows and Members of the American Medical Association:

The Annual Session of the House of Delegates of the American Medical Association will be held in Chicago, Illinois, from Monday, December 3, to Thursday, December 6, 1945.

Herman L. Kretschmer, President.
H. H. Shoulders,
Speaker, House of Delegates.

Attest:
Olin West, Secretary,
Chicago, September 14, 1945.

SYRINGE TRANSMITTED HEPATITIS

The occurrence of jaundice in American and British troops and in the natives of Brazil following administration of yellow fever vaccine was a serious problem early in the war. Elimination of the human serum in the preparation of the vaccine prevented such jaundice, which was demonstrated to be of hepatic and not of hemolytic origin. The hepatitis or the syndrome of "homologous serum jaundice" presented as a constant feature the long interval between the injection of a human blood product and the appearance of jaundice. The incubation period is sixty to ninety days. The nature of the icterogenic factor in the human serum has not been determined, although many believe it to be a virus.

Bigger [1] has concluded that jaundice in syphilitic patients who receive intravenous arsenicals is due to transmission of a virus from patient to patient and not to the toxic effect of the arsenical on the liver. MacCallum [2] clearly demonstrated that hepatitis in syphilitic patients under arsenical treatment results from the transmission of an infective agent on syringes and needles. Dible, McMichael and Sherlock [3] did not find histologic criteria for the differentiation of the lesions resulting from epidemic hepatitis, arsenotherapy and serum inoculations in their aspiration biopsy studies of 56 cases of acute hepatitis. Sheehan [4] observed that epidemic hepatitis can be transmitted from one patient to another by syringes used for collecting blood. Droller [5] reported the occurrence of hepatitis among patients in a diabetic clinic as the result of collecting blood in syringes which were not boiled. The accumulation of recent data suggests that any syringe used for taking blood may be potentially icterogenic.

The data with regard to syringe transmitted infection are in accord with what is known about hepatitis transmitted by the injection of yellow fever vaccine containing dried human plasma, of measles or mumps convalescent serum and of blood in transfusions. In all cases injection of presumably infected human blood or plasma has been followed by cases of hepatitis two or four months later. Darmady and Hardwick [6] found among 182 consecutive patients with jaundice admitted to their hospital that 34 had received intravenous or intramuscular injections within the previous two hundred days. These authors stress two points in the prophylaxis of syringe hepatitis: First, the quantity of icterogenic principle involved may be extremely small and can be harbored in any syringe. Thus Bradley, Loutit and Maunsell [7] produced jaundice in human subjects by the administration of as little as 0.1 cc. of homologous serum. Secondly, this agent is heat resistant and is not killed by the ordinary methods of sterilization.

All syringes and apparatus used for the intravenous or intramuscular injection of human subjects should be sterilized by dry heat. To secure blood for laboratory purposes a syringe is unnecessary, provided a tourniquet is used. Enough blood can be withdrawn from the vein by the use of a wide bore needle alone, allowing the blood to drip into the appropriate tube. Mendelssohn and Witts [8] have demonstrated that, when blood is taken from a vein with a syringe by the orthodox technic, some of the blood is sucked back into the vein when the tourniquet is released. If, therefore, the syringe is not sterile, the patient is exposed to infection.

A committee of experts appointed by the Medical Research Council (England) under the chairmanship of Professor G. S. Wilson made a number of recommendations on the subject of proper sterilization of syringes.

1. Bigger, Joseph W.: Jaundice in Syphilitics Under Treatment, Lancet **1**: 457 (April 10) 1943.
2. MacCallum, F. O., and Bauer, D. J.: Homologous Serum Jaundice, Lancet **1**: 622 (May 13) 1944.
3. Dible, J. H.; McMichael, John, and Sherlock, S. P. V.: Pathology of Acute Hepatitis, Lancet **2**: 402 (Oct. 2) 1943.
4. Sheehan, H. L.: Epidemiology of Infective Hepatitis, Lancet **2**: 8 (July 1) 1944.
5. Droller, Hugo: An Outbreak of Hepatitis in a Diabetic Clinic, Brit. M. J. **1**: 623 (May 5) 1945.
6. Darmady, E. M., and Hardwick, Christopher: Syringe-Transmitted Hepatitis, Lancet **2**: 106 (July 28) 1945.
7. Bradley, W. H.; Loutit, J. F., and Maunsell, Kate: An Episode of Homologous Serum Jaundice, Brit. M. J. **2**: 268 (Aug. 26) 1944.
8. Mendelssohn, K., and Witts, L. J.: Transmission of Infection During Withdrawal of Blood, Brit. M. J. **1**: 625 (May 5) 1945.

They point out that intravenous injection of drugs will usually contaminate the syringe with the patient's blood, as Mendelssohn and Witts have demonstrated; that any one with acute or recent respiratory infection should wear a mask during manipulation of syringes. Much of the trouble with syringes comes from failure to clean them properly before resterilization. Thorough cleansing is particularly needed when the syringe has been used to aspirate blood or pus. While sterilization in the hot air oven (160 C. for one hour) or in the autoclave is best, sterilization by boiling must often be adopted and is effective against all but highly resistant sporing organisms. Chemical disinfection of syringes has many disadvantages and the only permissible disinfectant is 70 to 75 per cent alcohol. Even then, only all-glass syringes disassembled and immersed under the alcohol for five minutes can be guaranteed to be free of vegetative pathogens. This method of sterilization is therefore justified only for such procedures as insulin injections, in which heating sterilization is impracticable.

The accumulation of data regarding the occurrence of homologous serum jaundice suggests the necessity for revision of the existing injection technics particularly as regards sterilization of syringes and needles.

PREVENTION OF FROSTBITE GANGRENE

Using their new fluorescein test, Lange and his associates [1] of New York Medical College have added new basic facts to the pathologic physiology of frostbite. In this test small amounts of fluorescein are injected intravenously, and the migration of the material through the blood stream and into interstitial tissue spaces is followed under ultraviolet light. Applying these new technics, the New York clinicians have suggested a promising new method for the prevention of post-frostbite gangrene.

In Lange's initial experiments, 6 rabbits were depilitated on the abdomen and exposed to cold by applying the bottom of a small beaker filled with solidified carbon dioxide for periods varying from five to ninety minutes. Under this exposure the local area freezes solid and thaws after intervals varying from fifteen to twenty-five minutes, depending on the length of the exposure. For periods varying from thirty to one hundred and twenty minutes following such refrigeration, fluorescein does not appear in the exposed area, indicating a severe initial spasm of the blood vessels. This is followed by gradual vasodilatation, fluorescein appearing in the exposed area. Diffusion into the surrounding tissues is soon many times greater than in nonexposed skin, giving the picture of local hyperfluorescence. This period is characterized also by swelling of the exposed tissues.

Eight to fourteen hours after exposure, a repeat fluorescein injection shows that the exposed spot is again relatively nonfluorescent, indicating a terminal interference with the local circulation. Biopsies at this period show a clumping of the red blood cells in the smaller blood vessels, confirming the "silting" or "sludge formation" previously described by Scandinavian [2] and British [3] investigators. This clumping does not represent true thrombus formation since the clumped erythrocytes are readily washed out by a simple saline injection. After approximately seventy-two hours true or organized thrombi are formed, at which time the entire area becomes nonfluorescent and gangrenous.

If this terminal organized thrombosis could be prevented, the seriousness of frostbite gangrene could no doubt be reduced. Lange attempted to accomplish this by heparinization. Groups of rabbits were subjected to experimental frostbite of varying degrees of intensity. Within four hours, half of the members of each group were heparinized. In a typical group of 22 rabbits, one hind leg of each animal was protected by a thin boot of rubber and exposed to an alcohol-solidified carbon dioxide bath (— 20 C.) for a period of from forty-five to ninety minutes. Eleven of the exposed animals were then heparinized. Nine of these recovered without signs of gangrene; only 2 of them developed slight surface lesions. All of the untreated controls lost their legs by complete gangrene, including the bone.

The practical applicability of heparin therapy to human medicine was tested on volunteers from the Jewish Hospital of Brooklyn. Experimental frostbite was produced by applying for ten minutes to the upper part of the arm the bottom of a porcelain crucible filled with solidified carbon dioxide. The heparinization was started immediately, 1 volunteer of each group being untreated to serve as a control. All of the treated persons recovered without deep injury.

Thus far only 1 patient has been treated according to the new method. This man had been lying in the street at subfreezing temperature for at least fourteen hours. On admission his hands and the lower part of his legs were ice cold and remained so for five hours after admission. He was heparinized for five days by the intravenous route, the clotting time being held at between thirty and sixty minutes. He developed considerable blistering, especially on the hands, but escaped any permanent loss of tissue. Previous experience with similar cases had suggested that without heparinization there probably would have been some loss of the extremities.

Experiments are now in progress to perfect the method of heparinization and to determine the longest interval between exposure and start of therapy that will still be effective.

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1. Lange, Kurt, and Boyd, L. J.: Use of Fluorescein Method in Establishment of Diagnosis and Prognosis of Peripheral Vascular Diseases, Arch. Int. Med. **74**: 175 (Sept.) 1944; Science **102**: 151 (Aug. 10) 1945.

2. Kreyberg, L., and Rotnes, L.: Acta path. microb. Scandinav. **11**: 162, 1932.

3. Greene, Raymond: The Immediate Vascular Changes in True Frostbite, J. Path. & Bact. **55**: 259 (July) 1943.

FUNGICIDAL TITER OF CLAVACIN

In 1942 Waksman and his associates [1] of the New Jersey Agricultural Experiment Station described two new antibiotics, each of which was superior to penicillin in its bacteriostatic action on gram positive bacteria in vitro. One of these they named "clavacin" after the organism from which it was isolated (Aspergillus clavatus). Clavacin was particularly interesting since it was also bactericidal in high dilution against gram negative micro-organisms and bacteriostatic for certain common fungi. Since then clavicin has been isolated in crystalline form.

On first view, clavacin is of little clinical interest since it is highly toxic on intravenous or intramuscular injection into animals. Herrick [2] of the Hygienic Laboratory, University of Michigan, however, calls attention to the fact that many antibiotics are toxic on parenteral injection but most of them are nontoxic when given orally or applied externally. Since most fungous diseases are both local and superficial in character, the effects of clavacin on pathogenic fungi should be of clinical interest. Three typical pathogenic fungi were therefore tested by him: Monilia albicans (thrush), Oidium asteroides (blastomycetic dermatitis) and Trichophyton gypseum (epidermophytosis).

To test the fungistatic action of clavacin, serial dilutions of the crystalline product were made in liquid culture medium, and 25 cc. samples of each dilution inoculated with one drop of a heavy suspension of the organism to be tested. At the end of four to seven days' incubation, turbidity readings showed that growth of T. gypseum was distinctly inhibited by a 1 : 100,000 dilution of clavacin and totally inhibited by a 1 : 10,000 dilution. The two other organisms were slightly more resistant, requiring from two to four times these concentrations for similar effects.

To determine the fungicidal titers the test organisms were similarly exposed to higher concentrations of clavacin and viability tests made at stated intervals, washed centrifuge samples of the exposed organisms being used to inoculate subcultures. Failure of the subcultures to grow showed that all three test organisms were killed within fifteen minutes to one hour by 1 per cent clavacin and by the end of three hours by 0.5 per cent clavacin. The most susceptible organism (T. gypseum) was also killed within five hours by 0.1 per cent clavacin.

Since 0.5 per cent clavacin is lethal for all pathogenic fungi thus far tested, clavacin in this concentration should be of research interest in the treatment of local fungous infections of the skin and exposed mucous surfaces. Less concentrated solutions might be of prophylactic interest. Clinical tests, however, have not yet been reported.

1. Waksman, S. A.; Horning, E. S., and Spencer, E. L.: J. Bact. **45**: 233 (March) 1943.
2. Herrick, J. A.: Proc. Soc. Exper. Biol. & Med. **59**: 41 (May) 1945.

Current Comment

THE DISTINGUISHED SERVICE MEDAL

The Distinguished Service Medal of the American Medical Association will be presented for the eighth time at a meeting to be held during the regular session of the House of Delegates at the Palmer House in Chicago December 3 to 6. The first presentation of this medal was made in 1938 to Dr. Rudolph Matas of New Orleans. It has subsequently been awarded to Dr. James B. Herrick of Chicago in 1939, to Dr. Chevalier Jackson of Philadelphia in 1940, to Dr. James Ewing of New York in 1941, to Dr. Ludvig Hektoen of Chicago in 1942, to Dr. Elliott P. Joslin of Boston in 1943 and to Dr. George Dock of Pasadena, Calif., in 1944. This award is recognized as one of the most distinguished honors within the gift of the American Medical Association. Any Fellow of the Association may submit nominations, which should be sent, together with a record of the scientific services of the nominees, to the chairman of the Committee on Distinguished Service Award, Dr. A. A. Walker, 2250 Highland Avenue, Birmingham, Ala., or to the Secretary of the Association at 535 North Dearborn Street, Chicago. Of all nominations received by the Committee, five are submitted to the Board of Trustees of the Association, from which the Board selects three to be submitted to the House of Delegates at its first meeting at the time of its regular session. Immediately on submission of the nominations by the Board of Trustees, the House of Delegates by official vote selects the recipient of the honor, to whom the Distinguished Service Medal is presented at the meeting at which the President-Elect is installed as President, which usually is on Tuesday evening of the week of an annual session. An extensive list of distinguished physicians nominated for this award will enable the Committee, the Board of Trustees and the House of Delegates, all of whom participate in the selection, to determine for 1945 a recipient of distinction whose nomination will reflect favorably on himself and on the Association.

A LABOR LEADER DISCUSSES COMPULSORY SICKNESS INSURANCE

Times change, and the points of view of men change with time—but there are fundamental principles of human thinking and living that are eternal verities. On Dec. 5, 1916 a conference on social insurance was held in Washington to consider such problems as unemployment insurance, old age insurance and sickness insurance. Samuel Gompers, then president of the American Federation of Labor, speaking with deep feeling from some simple memoranda, warned organized labor of the threat inherent in the collectivist philosophy by which some leaders of labor are being seduced today. His address might well have been written as of today. Elsewhere in this issue (page 299) the address is published in full. Every leader of labor in the United States, every worker, every physician should read it and heed it. It is a cry of warning to those who would destroy the American democracy.

MEDICINE AND THE WAR

MEDICAL DEMOBILIZATION

NAVY

In the discharge of its obligation to the civilian public the Navy Department desires to accomplish as rapidly as possible the release of physicians, dentists, nurses and other officers and enlisted personnel of the Naval Reserve trained in medical fields. It is obvious that during the next few months they will be needed at almost full strength for the care, evacuation and disposition of the wounded and sick still coming from overseas and also in connection with general demobilization.

The transportation of wounded require full staffing at the point of departure, en route to the medical centers in the United States and within the naval hospitals and dispensaries of the continental United States. It should be remembered that the peak hospital census in military establishments in this country following V-E day was not reached until July 1.

The medical corps will perform a vital function over the next year or eighteen months in the separation process promised for over two and a half million men. Every man and woman returned to civilian life must be given a physical examination to include a chest x-ray, blood tests and any other testing individually indicated.

The necessary lag in medical demobilization behind general demobilization will be kept at an absolute minimum, and every effort will be made to respond at the earliest moment to the special needs of medical schools, teaching hospitals and individual and community hardship cases.

Effective September 15, therefore, the higher critical score for medical corps release is necessary, as announced in ALNAV 252. This critical score requires a total of 60 points on the following basis:

½ point for each year of age, computed to nearest birthday.
½ point for each month of active duty from Sept. 1, 1939.
¼ point additional for each month of active duty outside the United States since Sept. 1, 1939 (effective Sept. 15, 1945).
10 points for a state of dependency existing as of Aug. 15, 1945.

On this basis it is determined that 1,128 medical officers will be eligible for release by September 15, 190 additional by November 1, 137 additional by December 1 and 223 additional by January 1, or a total of 1,678. Thereafter it is expected that critical scores for release will be lowered by degrees in order to carry out the present plan to separate a total of 8,000 medical officers by Sept. 1, 1946.

Many medical officers in the Reserve desire opportunities for "refresher" training before returning to civilian practice. Assignments to duty in United States naval hospitals afford one means of supplying such training, and the average period of time allotted for this specific purpose will probably be about three months.

Officers who elect to continue on active duty for a "refresher" period after becoming eligible for release under the point system may do so if they so request. The request may state that it is understood that this continuance on active duty after eligibility for release is for the purpose of obtaining an assignment in a specific type of service in a naval hospital for "refresher" training.

In a limited number of instances such assignments may be available and possible before the full 60 points of eligibility for release have been reached, but this "refresher" training by hospital assignments may retain an officer beyond the date when his point eligibility for release becomes effective. Periods of assignments of this type, constituting active duty in any United States naval hospital officially approved for graduate or residency type training, may be submitted for credits before the American colleges and the American boards with every likelihood of acceptance.

Plans are projected for the peacetime utilization of medical officers of the Reserve on inactive duty as consultants, lecturers or otherwise in naval hospitals near their place of residence. Additional plans are under consideration in which the active assistance of reserve officers is desired and to be enlisted whereby junior medical officers in the regular Navy undergoing graduate training in United States naval hospitals may seek and obtain one year residency appointments in the foremost civilian institutions for the rounding out of their specialty training.

The graduate educational program of the medical corps of the regular Navy, already in full swing, and its peacetime administration offer inducement to medical officers of the Reserve to transfer to the regular Navy. This, it is hoped, may be sought by many.

The continued and active interest of our many reserve officers in the constant advancement of the medical corps of the United States Navy and in its aims is desired and solicited by the Bureau of Medicine and Surgery of the United States Navy.

ARMY

Following the termination of hostilities in Europe, the Surgeon General sought to build up maximum medical support in the Pacific for projected operations against Japan and simultaneously to provide an orderly system for the release of Medical Department officers after insuring that requirements would be met for the Army of Occupation in Europe and for hospitals in the United States with their large numbers of sick and wounded.

The early advent of V-J day necessitated radical changes in the Surgeon General's planning. The Pacific changed from a deficit theater in need of thousands of additional personnel for full-scale military operations to a surplus theater which had available for return large numbers of Medical Department personnel to the United States just as soon as the occupation of Japan had been completed. Improvement in the overall transportation situation likewise made it possible to accelerate the return of troops from the European and Mediterranean theaters, which presaged the more rapid return and separation of Medical Department personnel.

The cessation of hostilities in the Pacific also had important bearing on the large general and convalescent hospitals in the United States to which the more seriously sick and wounded are returned for definitive care. Except for small numbers of battle casualties now scattered through Pacific hospitals whose early return to the United States is a prime objective, no additional battle casualties will be evacuated and the patient flow from overseas will be limited to individuals with serious diseases or nonbattle injuries. This foreshadowed an early shrinkage in the general and convalescent hospitals at home.

The rapid demobilization of the Army during the coming months will necessitate the use of almost 2,000 Medical Corps officers at separation centers for final examinations. In addition, the large number of limited service personnel whose separation will be effected under the demobilization plan will further increase the requirement for Medical Corps officers for medical processing work.

Under the V-E plan, which was published in full in THE JOURNAL August 11, page 1104, it was necessary to establish adjusted service ratings for separation as high as 120 for scarce Medical Corps specialists and 100 for nonscarce Medical Corps officers. These high adjusted service ratings reflected the fact that the Army was in a position to release Medical Department personnel only very slowly as long as the war in the Pacific continued and large numbers of battle casualties in the United States Army hospitals had not yet completed their treatment.

The worldwide distribution of Medical Corps officers as of the beginning of September is estimated as follows: approxi-

mately 22,000 overseas, 11,000 in the European theater and 9,000 in the Pacific and the Asiatic mainland; the remainder overseas are in other bases such as Newfoundland, the Middle East, on hospital ships, and in dispensaries of the Air Transport Command. There are about 16,000 in the United States, excluding 3,000 who are patients in hospitals and newly commissioned officers in training status. Another 4,000 were in transit to the Pacific as of V-J day; this group now becomes immediately available for separation or as replacements for high point individuals who can be separated immediately.

Under the V-E plan, almost 1,500 Medical Corps officers have been separated. The Surgeon General testified on August 31 for the Military Affairs Committee of the House of Representatives that he planned to separate a total of 13,000 Medical Corps officers, 25,000 nurses and 3,500 dentists by the end of this year.

It is estimated that about 6,000 Medical Corps officers will be returned from Europe for separation and that an equivalent number can be released from personnel now in the United States. Surplus medical personnel will be returned from the Pacific as expeditiously as possible. A commission is now on its way to the Pacific to determine the exact number of surplus personnel. As already stated, 1,500 doctors have already been released under the V-E plan, and it now appears that the 13,000 estimate presented by the Surgeon General to Congress may be exceeded.

The original criteria for the release of Medical Corps officers were geared to adjusted service ratings and age. On the basis of both military and civilian reactions, a third factor, length of service, has been added.

Table 1 summarizes the criteria for separation, any one of which is basis for relief from active military service.

Despite the cessation of hostilities, a limited number of Medical Department personnel must still be sent from the United States to overseas theaters to permit the return of high score individuals for separation. The criteria presented in table 2 have been established to govern the selection of personnel for overseas service, except for volunteers. Individuals to go overseas must have a point score below that listed in the table or be below the age therein shown.

The separation criteria now in effect will have to be revised on or before the end of this year. Present plans contemplate the lowering of criteria during the first half of 1946, which will include a provision for length of service as a basis for separation of officers who came on active duty after Pearl Harbor. On the basis of a 2.5 million army, the Surgeon General will be able to release from V-E strength approximately 30,000 Medical Corps officers and 10,000 dentists and more than 40,000 nurses.

TABLE 1.—*Criteria for Separation*

Corps	Adjusted Service Ratings	Age	Length of Service
Medical Corps	80	48	Prior to Pearl Harbor *
Dental Corps	80	48	Prior to Pearl Harbor
Veterinary Corps	80	42	Prior to 1941
Sanitary Corps	70	42	Prior to Pearl Harbor
Medical Administrative Corps	70	42	Prior to Pearl Harbor
Army Nurse Corps †	35	35	
Medical Department Dietitians †	40	40	
Physical therapists †	40	40	

* Except grades A, B and C of ophthalmologists and otorhinolaryngologists, orthopedic surgeons and medical laboratory officers, all grades of neuropsychiatrists and plastic surgeons (prior to Jan. 1, 1941).
† In addition, married, dependents under 14.

TABLE 2.—*Criteria Governing Selection for Overseas Service*

Corps	Adjusted Service Ratings	Age
Medical Corps	45	40
Dental Corps	45	40
Sanitary Corps	45	35
Veterinary Corps	30	35
Medical Administrative Corps	30	35
Army Nurse Corps	12	30
Medical Department Dietitians, Physical Therapists	18	30

ARMY

NEW SCHOOL OF PREVENTIVE MEDICINE

A school of preventive medicine, the first of its kind in the Army, has been organized at Army Headquarters, Middle Pacific, Fort Shafter, T. H., and will leave shortly for Manila for duty under General of the Army Douglas MacArthur. The purpose of the school, which is composed of a selected group of 14 officers and 28 enlisted men, is to train army personnel in the most efficient methods of protecting troops from disease. The staff includes specialists in epidemiology, sanitation, malaria, biostatistics, mammology, nutrition, entomology, parasitology and industrial hygiene.

Three regular courses and a special course will be taught. A four weeks course for Medical Department officers will provide instruction in epidemiology, control of insect borne disease, sanitary engineering, venereal disease control, nutrition, industrial hygiene, environmental sanitation and rodent control. It is planned that twenty-five officers at a time will be enrolled in this course. The line officers' course, lasting two weeks and accommodating twenty students, will teach battlefield hygiene, including insect and rodent control, water discipline, garbage disposal and control of other factors which could cause epidemics among troops. A similar course of the same length and student capacity is designed for noncommissioned officers.

Under certain circumstances a special team from the school will be dispatched to the location of units to conduct one or more of the courses, varying in length and number of students according to the time available and the needs of the unit. Sufficient supplies and equipment can be carried by the group to sustain itself without the necessity of becoming attached to any hospital for food and quarters.

ARMY AWARDS AND COMMENDATIONS

Captain Ludwig J. Pyrtek

The Bronze Star was recently awarded to Capt. Ludwig J. Pyrtek, formerly of Hartford, Conn., "for meritorious service in connection with military operations against an enemy of the United States from July 11, 1944 to April 24, 1945. Captain Pyrtek," the citation continued, "as medical officer in a clearing company for an infantry division and later in collecting company for an infantry regiment during this period has displayed extraordinary ability, tireless energy, understanding sympathy and deep devotion to duty. Handling the patients coming under his care with a superior degree of professional skill, he has been responsible for the saving of many lives. His constant consideration of the welfare and comfort of the wounded and the efficient and unselfish manner in which he has contributed to the successful operation of these two organizations reflect credit on his character and ability as an officer and on the Medical Corps of the Army." Dr. Pyrtek graduated from Rush Medical College, Chicago, in 1942 and entered the service Aug. 13, 1943.

Lieutenant Colonel Isidore A. Feder

The Legion of Merit was recently awarded to Lieut. Col. Isidore A. Feder, formerly of Brooklyn. The citation accompanying the award read "For exceptionally meritorious conduct in the performance of outstanding service, as chief of medical service of the 45th Evacuation Hospital from Aug. 2, 1944 to May 10, 1945. Lieutenant Colonel Feder made many recommendations on the treatment of battle casualties which have been adopted throughout the Ninth United States Army. The skill and dispatch with which he organized a tuberculosis service in Buchenwald at the notorious German concentration camp

rapidly relieved a critical epidemic risk at that institution. The judgment and devotion to duty displayed by Lieutenant Colonel Feder reflect highest credit on himself and on the armed forces of the United States." Dr. Feder graduated from Tufts College Medical School, Boston, in 1927 and entered the service Aug. 12, 1942. Dr. Feder is also the recipient of the Bronze Star (THE JOURNAL, July 7, 1945, p. 738).

Major Luther C. Heidger

The Bronze Star was posthumously awarded to Major Luther C. Heidger, formerly of Stratford, Conn., for "service from March 2 to Sept. 7, 1944 at Lasang, Davao, Philippine Islands, and aboard a prison ship. As senior medical officer of a prisoner of war camp and aboard an enemy prison ship he performed his work exceptionally well even though seriously handicapped by lack of medicine and equipment. Aboard the ship he requested the enemy to furnish more air and water for the prisoners and used every persuasive means possible to obtain the bare essentials of life for his men. He devoted his entire attention to furnishing medical aid and by his understanding and encouragement he inspired the men and gave them hope. He sacrificed his life in the course of his patient devotion to duty." Dr. Heidger graduated from the University of Vermont College of Medicine, Burlington, in 1921 and entered the service Sept. 12, 1941.

Captain Charles F. Lewis

Capt. Charles F. Lewis, formerly of Oakland, Calif., was recently awarded the Bronze Star. "While a prisoner of war in Japanese Prison Camp No. 1, Cabanatuan, Philippine Islands, from October 1944 to January 1945," the citation read, "he performed outstanding services as ward surgeon in a general hospital. With improvised, makeshift equipment and depleted medical supplies, he labored against great odds and on a starvation diet. In addition to his medical duties he served as commanding officer of the medical detachment, a task which required day and night duty under extremely hazardous conditions. His excellent leadership, his cheerful attitude and his unfailing courage and devotion to duty were a great inspiration to the entire prison camp." Dr. Lewis graduated from the University of Louisville School of Medicine in 1940 and entered the service July 12, 1941.

Lieutenant Colonel John Groopman

The Soldier's Medal was recently awarded to Lieut. Col. John Groopman, formerly of New York, "for heroism in the Burma-China-India theater of operations. Colonel Groopman voluntarily risked his life on the night of July 8, 1944 while serving as medical officer of the day at an air base in China." The citation stated further that "Groopman, without regard for personal safety, ran to a burning bomber plane, loaded with gasoline, bombs and ammunition, that had crashed at the end of a runway and attempted to extricate its crew. He was warned that the bombs and ammunition might explode at any moment and indeed ammunition did go off from time to time, but he insisted on crawling close to the burning plane in an effort to render aid." Dr. Groopman graduated from New York University College of Medicine, New York, in 1932 and entered the service Oct. 5, 1940.

Captain Floyd M. Burgeson

The Bronze Star was recently awarded to Capt. Floyd M. Burgeson, formerly of Des Moines. "As American surgeon at the Szubin, Germany, prisoner of war camp from October 1944 to January 1945," the citation read, "he displayed marked devotion to duty and high professional skill in conserving the health and improving the well-being of many hundreds of American officer prisoners of war." Dr. Burgeson graduated from the State University of Iowa College of Medicine, Iowa City, in 1934 and entered the service Feb. 10, 1941.

Merle M. Musselman

The Bronze Star was recently awarded to Capt. Merle M. Musselman, formerly of Tucson, Ariz. The citation stated that "while a prisoner of war in Japanese Prison Camp No. 1, Cabanatuan, Philippine Islands, from October 1944 to January 1945 he performed outstanding services as chief of the surgical service and ward surgeon in a general hospital. With improvised, makeshift equipment and depleted medical supplies he labored against great odds and on a starvation diet. He cheerfully assumed additional duties as chief of laboratory and x-ray service and of attending surgeon. His devotion to duty and unfailing courage, his outstanding performance under extremely difficult and hazardous conditions were an inspiration to the entire prison camp." Dr. Musselman graduated from the University of Nebraska College of Medicine in 1939 and entered the service July 1, 1941.

Captain Laurence K. MacDaniels

The Bronze Star was recently awarded to Capt. Laurence K. MacDaniels, formerly of Portland, Ore., for work in Belgium and Germany. "As commanding officer of the battalion medical detachment, he constantly served as an inspiration to his men. On numerous occasions he courageously ignored enemy artillery and small arms fire to render prompt and effective treatment to the wounded. Personal fatigue and unfavorable conditions did not deter him from his tasks. With indefatigable energy and profound judgment he rigorously trained the men of his detachment in the performance of their vital duties, never hesitating to instruct them by his personal example." Dr. MacDaniels graduated from the University of Oregon Medical School in 1941 and entered the service Aug. 1, 1942.

Lieutenant Colonel Hjalmar T. Gentle

Lieut. Col. Hjalmar T. Gentle, formerly of Medford, Ore., was recently awarded the Bronze Star. As commanding officer of the 9th General Dispensary, "he has been solely responsible for the efficient and effective manner in which it was set up, organized and operated. By virtue of his keen organizational ability, unerring sense of duty and professional knowledge, he has made it possible for the dispensary to serve the entire headquarters with the least amount of inconvenience and the highest type of efficiency." Dr. Gentle graduated from the University of Oregon Medical School, Portland, in 1929 and entered the service Aug. 11, 1941.

Captain James W. Wiley

The Air Medal was recently awarded to Capt. James W. Wiley, formerly of Portland, Ore., "for meritorious achievement while participating with the 493d Bomber Group in heavy bombardment missions in air offensives against the enemy over Europe. The courage, coolness and skill displayed by this officer on these occasions reflect great credit on himself and on the armed forces of the United States." Dr. Wiley graduated from the University of Oregon Medical School, Portland, in 1933 and entered the service Oct. 28, 1942.

Captain Edmund A. Melvin

The Air Medal was recently awarded to Capt. Edmund A. Melvin, formerly of Gulfport, Miss., "in recognition of meritorious achievement while participating in aerial flights in the European Theater of Operations." Dr. Melvin graduated from the University of Tennessee College of Medicine, Memphis, in 1938 and entered the service Feb. 17, 1942. Dr. Melvin also wears the Distinguished Service Unit citation badge awarded his group for its performance during the "Battle of the Bulge" in December 1944.

Major Oram R. Lawry Jr.

Major Oram R. Lawry Jr., formerly of Portland, Maine, was recently commended by the commanding officer of the 65th General Hospital for his clinical work with that medical unit. Dr. Lawry graduated from the University of Pennsylvania School of Medicine, Philadelphia, in 1939, the Medical Field Service School, Carlisle Barracks, Pa., in 1941 and the Command and General Staff School, Fort Leavenworth, Kansas, in 1943. He entered the service in July 1941.

Captain Katsumi J. Nakadate

Capt. Katsumi J. Nakadate, formerly of East Chicago, Ind., was awarded the Bronze Star for "outstanding first aid work during a glider borne troop action last March, near Hussmanshof in Germany." Dr. Nakadate graduated from the University of Oregon Medical School, Portland, in 1939 and entered the service May 6, 1943.

PHYSICIANS SEPARATED FROM SERVICE

RELEASES REPORTED FROM ARMY, NAVY AND PUBLIC HEALTH SERVICE PRIOR TO SEPTEMBER 1

Physicians	Date Discharged

Alabama

Alexander, William W.	April 1945
Dennis, Jeptha W.	March 1945
Hagood, Daniel L.	September 1943
Kennedy, William C.	January 1945
Newhauser, Mayer A.	

Arizona

Brann, Harold W.	
Collins, Robert A.	February 1945
Flood, Clyde E.	March 1945
Norris, Samuel R.	February 1945

California

Adams, Morgan K.	April 1945
Babcock, Donald T.	February 1945
Banks, Harry B.	
Bell, Hugh W.	March 1945
Brown, William E.	
Duckworth, John F.	September 1943
Duncan, Ralph A.	February 1945
Dwire, Francis B.	December 1943
Evans, Howard F.	January 1944
Guzak, Steven V.	April 1945
Hantsch, Ferdinand K.	
Harkness, James T.	March 1944
Hein, Gordon E.	March 1945
Henry, Ziba L.	September 1943
Herrmann, Albert J.	
Isaak-Jantzen, Constantine J.	July 1945
Laugeson, Lyder L.	August 1943
Lawrence, Walter	
Lengyel, Emile	March 1944
Leveton, Albert L.	February 1945
Lewis, Charles H.	April 1945
Long, Frank L.	
Mansfeldt, John H.	May 1943
Mason, Christopher A.	February 1944
McMillian, Clemens W.	October 1944
Miltenberger, Vale E.	January 1945
Murray, Alexander	October 1943
Padden, Edmund H.	April 1945
Parks, Ben K.	
Pasmore, John L.	March 1945
Praglin, Daniel	February 1945
Redpath, Nathaniel J.	February 1945
Roach, Richard A.	
Scheffel, Alfred G.	
Siegel, Lawrence S.	
Sizer, Edgar R.	February 1945
Sonneland, Sidney G.	February 1945
Treichler, Albert J.	October 1943
Watts, Floyd J.	February 1944
Wilson, John W.	
Worener, Charles A.	January 1943

Colorado

Altieri, John A.	April 1945
Atlas, Andor H.	April 1945
Buck, Carroll D.	August 1945
Coleman, John M.	August 1943
Heine, Walter F.	September 1943
Helfrich, Jesse B.	January 1944
McClure, Harlan E.	March 1945
Segard, Edwin S.	September 1944
Soda, William E.	December 1943
Stapleton, James A.	April 1945

District of Columbia

Bernheim, Julian R.	September 1944
Borden, Daniel L.	March 1945
Conger, Jason H.	
Dewey, George	April 1945
Dollman, Clarence M.	December 1944
Gustites, Francis W.	March 1945
Huggins, John B.	February 1945
Magee, James C.	
Marvin, Horace P.	September 1944
McKinney, Garfield L.	August 1945
Mordecai, Alfred	June 1944

District of Columbia—Continued

Neale, Claude L.	March 1943
Nelson, Kenneth R.	February 1943
O'Malley, John J.	March 1943
Pringle, John A.	February 1944
Robinson, Murry M.	November 1943
Sawyer, Harold P.	November 1944
Siler, Joseph F.	February 1944
Weidner, Edward T.	June 1943
Whitted, Harold H.	March 1945

Illinois

Bay, Anthony	September 1943
Beanstock, Sam	April 1945
Boykoff, Max P.	March 1945
Conforti, James H.	February 1945
Cook, George W.	January 1945
Costich, Kenneth J.	
Culhane, Thomas H., Jr.	March 1945
Cummings, Claude W.	September 1944
Davis, Loyal	
De Trana, Frank A.	February 1943
Duggan, Daniel J.	February 1944
Frisch, Isaac J.	April 1945
Garrett, Roy P.	April 1945
Gibson, Paul W.	October 1943
Grendeske, Joseph A.	
Grombacher, Curt S.	February 1945
Grossman, Aaron	April 1944
Hackett, Joseph J.	June 1944
Hartford, William S.	May 1943
Haskins, William V.	
Horodko, Edward J.	March 1945
Horwitz, Harvey	September 1943
Hungness, Norman O.	February 1945
Hunsaker, Curtis A.	March 1944
Johnson, Carl A.	March 1945
Karras, Ray W.	February 1944
Keane, John W.	June 1944
Koenig, Frank J.	
Kutza, Michael J.	
Lepak, Alfred J.	June 1945
Lucatorto, Vito R.	
Mayes, Corwin S.	November 1944
Melendez, Stanis S.	April 1945
Miller, Louis	March 1945
Munson, Gordon B.	February 1945
Patka, Joseph A.	March 1945
Petrone, Joseph	March 1945
Reasoner, Mathew A.	November 1944
Reich, Walter J.	January 1943
Rooney, James A.	June 1943
Seinfeld, Samuel G.	
Shultz, Gordon H.	January 1944
Siegel, Vivien P.	April 1943
Simonelli, Mario	April 1945
Steinhoff, Carl F.	April 1945
Thoma, John W.	
Wagenseller, Samuel M.	February 1945
Young, Francis W.	March 1945

Indiana

Albertson, Frank P.	January 1945
Atcheson, Bellfield	February 1945
Balch, James F.	January 1945
Ballenger, William E.	April 1945
Geiger, Dillon D.	February 1945
Helwig, Edward C.	
Hicks, James M.	February 1945
Hord, Luther J. Jr.	August 1945
Ikins, Ray G.	February 1945
Moore, George S.	
Nisenbaum, Harold	October 1943
Panares, Solomon V.	April 1945
Peak, Ira F.	
Rendel, Harold E.	January 1945
Smith, Roy L.	March 1945
Stern, David H.	April 1945
Szabo, Stephen A.	April 1945
York, Arthur F.	March 1945

Iowa

Beddoes, Morris G.	April 1945
Cogley, John P.	November 1944
Davis, George V.	
Dolmage, George H.	January 1945
Faber, Luke A.	
Marinos, Harry G.	April 1945
Marker, John I.	April 1945
Stark, Callistus H.	April 1945

Kansas

Auchard, Virgil M.	June 1945
Bell, Cleo D.	March 1945
Cairns, Douglas W.	February 1944
French, Sanford W.	December 1944
Goldstein, Isadore I.	February 1945
Johnston, Thomas E.	
Manley, Joseph W.	March 1945
Whittier, Raymond W.	August 1943

Kentucky

Adkins, Hugh P.	March 1945
Bowen, Albert S.	September 1943
Choate, Benjamin D.	
Holmes, Claude D.	September 1944
Mayer, Frederick	
Miller, Joseph R.	
Wilson, Foster M.	January 1945
Wright, Alomzo W.	May 1945

Louisiana

De Matteo, Ignatius M.	March 1945
Hirsch, Edward K.	December 1944
Hunter, Matthew C.	February 1944
McConnell, Jesse M.	February 1945
Moore, Tarleton F.	
Quantz, Herman C.	November 1944
Rea, Melvin O.	
Rogers, Gordon K.	April 1943
Vella, Joseph A.	April 1944
Woldenberg, Samuel C.	November 1943

Maryland

Burwell, Albert C.	April 1945
Cox, Matthew M.	March 1945
Crampton, Alexander B.	
Eleder, Franklin C.	March 1945
Friedman, Henry T.	February 1945
Hulla, Jaroslav	March 1945
Hussey, Raymond	March 1945
Madigan, John J.	November 1944
Tobias, Herbert R.	
Triplett, William H.	April 1945
Weems, George J.	March 1945

Massachusetts

Baer, Victor	February 1945
Braverman, Aaron H.	
Edmonston, Raphael A.	February 1945
Goldman, Max	February 1945
Guptill, Clifford R.	February 1945
Hobica, Norman	February 1943
King, Alfred E.	June 1945
Kolozetski, John W.	March 1945
McElligott, Maurice J.	March 1945
Nugent, John L., II	March 1945
Patton, William E.	August 1944
Perkins, George E.	February 1945
Rovner, Miah H.	October 1943
Steele, Fred, Jr.	
Walsh, John F.	November 1943
Wyer, Harry G.	December 1943

Michigan

Barnes, Allan C.	January 1945
Collins, James I.	
Clifford, John E.	June 1943
Ducey, Edward F.	October 1944
Goldsmith, Joseph D.	
Griffith, Lucian S.	February 1945

PHYSICIANS SEPARATED FROM SERVICE

RELEASES REPORTED FROM ARMY, NAVY AND PUBLIC HEALTH SERVICE PRIOR TO SEPTEMBER 1

Physicians	Date Discharged
Michigan—Continued	
Hammer, Edwin J.	
Kadin, Maurice	March 1945
Lam, Conrad R.	
LaRiviere, Joseph O.	May 1944
Levin, Meyer M.	April 1945
McLeod, Kenneth W.	December 1943
Mitchell, Harold C.	March 1945
Moran, Frank T.	March 1945
Riley, Ray B.	January 1940
Rosen, Robert	
Slevin, John G.	March 1945
Turnbull, Jack V.	February 1945
Van Riper, Steven L.	
Weaver, Delmar F.	
Weber, Manuel L.	February 1944
Welsh, Herbert D.	October 1943
Winter, Frank E.	April 1944
Minnesota	
Bohnsack, Ralph W	March 1945
Borden, William B.	January 1943
Bosland, Howard G.	
Kirklin, Byrl R.	February 1945
Kozberg, Oscar	February 1945
Meyer, Ralph R.	April 1945
Nauth, Bernard S.	April 1945
Robertson, Frank O.	March 1945
Sax, Milton H.	March 1945
Schmidt, George F.	July 1945
Urberg, Sofus E.	March 1945
Montana	
Farnsworth, Ray B.	
New Jersey	
Burkett, Wendell J.	
Cetrulo, Gerald I.	February 1945
Duffy, Joseph F.	
Goldmacher, Hyman B.	March 1943
Goldstein, Herman H.	
Green, Morris	
Griffin, Donald C.	July 1943
Holman, Francis W	March 1945
Hunter, Harold H.	July 1944
Kahn, Leo	
Levine, David B.	April 1945
McPherson, Malcolm E.	April 1945
Schenker, Benjamin N.	April 1945
Schwarzwald, Irving	September 1943
Stewart, David F.	March 1945
Way, Clarence W	February 1945
New York	
Apfel, Kalman	December 1944
Arnone, Peter R.	February 1945
Backer, Max B.	January 1945
Basora, Ramon E.	
Belden, Alvin E.	March 1945
Bell, Julius W.	
Bennett, Robin I.	
Berlowitz, David M.	
Bissell, Merlyn A.	March 1945
Blumberg, Ralph	February 1945
Bolten, Richard S.	July 1943
Cassidy, Michael A.	June 1944
Clark, James T.	April 1945
Cochran, Albert H. Jr.	
Cohen, Lester	
Collins, Charles H.	February 1945
Daniel, Richard L.	February 1945
Dankberg, Julius	April 1945
Davidson, Sol C.	April 1943
Davis, Charles F.	December 1944
Davis, Harold	March 1945
Dewey, Christian H.	October 1944
Eissner, Morris T.	
Foldes, Andrew	April 1945
Frucht, Arthur I.	February 1945
Gilbert, William V.	June 1943
Giliberty, Richard P.	
New York—Continued	
Goldstein, Jacob W.	March 1945
Gould, Charles K.	February 1945
Greenberg, Samuel A.	May 1945
Herold, Lewis J.	April 1945
Hoffman, William	
Immordino, Santo	
Italiener, Harry D.	February 1945
Kaback, Harry	February 1945
Kennedy, Francis J.	May 1945
Klein, Lionel	
Kramer, Philip	April 1945
Lanza, Anthony J.	February 1945
Lasher, Willis W.	March 1945
Leshne, Samuel	March 1945
Lindenauer, Harold J.	February 1944
Lookstein, Abraham	May 1945
Looram, James F.	
Lucas, Hernon F.	June 1943
Mancuso, Ferdinand	July 1944
Mangum, Clarke W. Jr.	March 1945
Mayer, Stephan K.	
McDermott, William F.	January 1943
McEwen, Currier	
Menuhin, Norbert	September 1943
Nueske, Frederick W.	
Overton, Jesse W.	February 1944
Pacella, Bernard L.	June 1943
Rampond, James R.	March 1945
Reich, Abraham J.	July 1943
Rosen, Alexander S.	March 1945
Rosenberg, Arthur	
Schenker, Abraham W.	April 1945
Schier, Woodrow W.	November 1944
Schimenti, Matthew L.	April 1945
Schneider, Edward	
Sclar, Meyer	July 1945
Scobie, Russell B.	January 1943
Seibel, Jacob M.	June 1943
Shaw, Herbert G.	October 1943
Sherman, Bernard K.	March 1943
Sirota, Jonas H.	May 1945
Skinner, Louis C.	April 1945
Snitkoff, Morris C.	April 1945
Solby, Bruno	November 1943
Somberg, Harold	
Spiegler, Arnold A.	February 1943
Spinuzza, Joseph Y.	February 1945
Spitzer, Nat D.	
Steacy, George H.	August 1943
Stewart, Neville E.	April 1945
Talbot, Theodore J.	March 1945
Tumolo, Mauro A.	June 1943
Vaisberg, Maurice	November 1943
Van Alstyne, Walter K.	September 1943
Vogel, Walter	February 1945
Weinauer, Herbert	February 1943
Weymuller, Louis E.	February 1945
Wilshusen, Herbert F.	April 1943
Wineburgh, Jacob J.	February 1945
Young, Josef	April 1945
Zander, Ernst	January 1944
Zuckerman, William	March 1945
Ohio	
Berry, Harry R.	August 1943
Beltz, Robert V.	December 1944
Brumbaugh, John D.	April 1944
Bryant, Maurice E.	March 1944
Buckner, Leslie M.	February 1944
Burstein, Theodore	February 1944
Czarnecki, Casimir J.	March 1945
Faul, William L.	February 1945
Fay, James J.	
Frolkis, Nathan P.	
Gilbert, Norton H.	February 1945
Green, Warren W.	September 1944
Greenwell, Charles	
Hanysh, Myron C.	January 1945
Hoiston, Guilford B.	March 1945
Ohio—Continued	
Johnson, Bernard L.	April 1943
Knislely, Alan D.	March 1945
Kocour, James L.	May 1945
Krishna, Ikbal	February 1945
McKelvey, Robert H.	April 1945
Mynchenberg, George C.	May 1943
Nesemann, Reynold M.	April 1944
O'Brien, John W.	
Opaskar, Carl G.	August 1944
Porbe, Clarence O.	April 1945
Post, Edward S.	
Potter, Frederick C.	April 1945
Shaffer, Edwin F.	July 1943
Stacy, John R.	December 1943
Stires, Frederick H.	May 1944
Thomas, Harold B.	February 1945
Tyler, George P. Jr.	March 1945
Welch, Brent A.	May 1945
Oklahoma	
Bond, Ira T., Jr.	September 1943
Crumrine, Leslie B.	
Loughmiller, Robert F.	August 1944
Love, Albert J.	February 1945
McCaleb, Philip S.	November 1944
Murdoch, Raymond L.	February 1945
Rayburn, Charles R.	April 1945
Stevens, James W.	February 1945
Tisdal, William C.	March 1945
Pennsylvania	
Baltimore, Charles	February 1945
Brunacci, Alfred W.	February 1943
Dabney, Albert S.	December 1943
Eperjessy, Ernst Z.	March 1945
Evans, William H.	
Fisher, Bernard	
Fisher, Morris L.	
Fitz-Hugh, Thomas	January 1945
Ford, John J.	January 1945
Friedman, Jacob T.	
Goldman, Max R.	February 1945
Gruess, Emanuel M.	June 1943
Hendricks, Charles S.	December 1944
Hitchens, Arthur P.	October 1944
Hoffman, William L.	January 1944
Israel, Isaac J.	October 1943
Kotzin, Isadore	
Lanz, Kenneth P.	March 1945
Laws, Elbert H.	January 1943
Leavitt, Milo D.	March 1945
Lewis, Arthur K.	April 1943
McCluskey, Edmund R.	February 1943
McCormick, John J.	April 1944
McGlynn, Patrick J.	
Miller, Earl B.	April 1945
Mira, Joseph A.	
Ozellers, Edward I.	April 1943
Pompizzi, Ermin D.	
Ransavage, Leo A.	January 1943
Reed, Joe G.	February 1945
Resnick, George J.	October 1943
Riofski, Anthony F.	
Rumsey, John L.	March 1945
Runkle, Stuart C.	December 1943
Rutberg, Franklin L.	March 1945
Sackey, Maurice S.	
Schatz, David H.	
Schindler, John A.	
Schramm, Francis M.	February 1945
Staman, Harry	October 1943
Starkes, Carlton	March 1945
Steele, Robert	April 1943
Sugerman, Joseph R.	May 1945
Taggart, George W.	March 1943
Thomas, Harry B.	
Walnista, Frank J.	April 1945
Wilson, Thomas R.	
Zemo, Peter	

PHYSICIANS SEPARATED FROM SERVICE

ARMY MEDICAL CORPS OFFICERS RECOMMENDED FOR/OR RELIEVED FROM ACTIVE DUTY

Name Rank Address

Alabama

Barnes, Rhett Goode, Major, Winfield.
Minot, Wallace D., Capt., Pippen St., Eutaw.

Arizona

Jordan, Fred C. Jr., Capt., 910 W. Portland St., Phoenix.

Arkansas

Kelly, Robert M., Capt., Sheridan.
King, Jack A., Capt., Elaine.
Mobley, High, Major, Searcy.

California

Bivins, Thomas E., Capt., 316 Main St., Salinas.
Brem, Thomas H., Capt., 1930 Wilshire Blvd., Los Angeles.
Buehler, George S., Major, 105 E. Philadelphia St., Whittier.
Bush, George, Capt., 320 Pine Ave., Long Beach.
Cooper, Alfred J., Major, 512 Commonwealth Bldg., San Diego.
Cronin, Daniel J., Lt. Col., 2187 35th Ave., San Francisco.
Feusner, Henry D., Capt., 3591 Ocean Front Walk, San Diego.
Gerbode, F. L. A., Lt. Col., 2560 Divisadero St., San Francisco.
Greene, William W., Major, 2965 25th Ave., San Francisco.
Hilty, Henry L., Major, 6206 Crenshaw Blvd., Los Angeles.
Hodgson, Henry M., Capt., 384 Post St., San Francisco.
Johnson, Richard P., Major, 5267 Boyd Ave., Oakland.
Jones, Glen E., Major, 106 S. Edgemont, Los Angeles.
Kirk, Arthur H., Capt., 3473 Home Ave., Fresno.
Kohlmoos, Heinrich W., Capt., 3270 Kempton Ave., Oakland.
Lindner, Harold H., Major, 31 Lagunitas Dr., San Francisco.
McKenna, Stephen E., Major, 5676 York Blvd., Los Angeles.
Mason, Charles E., Lt. Col., 2221 Olive St., Temple City.

Colorado

Allen, Kenneth D. A., Col., 452 Metropolitan Bldg., Denver.
Dickey, Lawrence D., Capt., 618 W. Mountain Ave., Ft. Collings.
Dugan, William D., Major, Hotchkiss.
Mossberger, Joseph I., Capt., Porter Hos. & San., Denver.

Connecticut

Alpert, Max, Major, 881 Lafayette St., Bridgeport.
Carey, William C., Major, 136 Eaton Ave., Meriden.
Higgins, Harold G., Capt., 64 W. River St., Milford.

Florida

Davey, Walter F., Capt., 75 W. Third St., Bx. 475, Stuart.
Jacob, Harold J., Capt., 1500 E. Gonzalez St., Pensacola.

Georgia

Baxley, Harry B., Major, Blakely.
Deal, Albert M., Major, 223 S. Main St., Statesboro.
Elliott, Cecil B., Capt., Grady Hosp., Atlanta.
Glisson, Charles S. Jr., Major, 1766 Rogers Ave., S.W., Atlanta.
Mauldin, John T., Major, 239 Moreland Ave. N.E., Atlanta.

Idaho

Brothers, William W., Col., 730 Garfield St., N. Pocatello.
Duncan David G., Capt., Council.
Hatch, Harvey A., Capt., 149 12th St., Idaho Falls.
Klinger, Marion Vorpe, Capt., 2414 Woodlawn Ave., Boise.
Meyers, Isadore, Major, 1516 Harrison Blvd., Boise.

Illinois

Abrams, Morris, Lt. Col., 1516 S. Tripp St., Chicago.
Bass, Howard H., Lt. Col., 34 S. Menard Ave., Chicago.
Blocksom, Berget H. Jr., Major, 2210 Harlem Blvd., Rockford.
Bohan, John E., Capt., Toulon.
Bornemeier, Walter C., Major, 4013 Milwaukee Ave., Chicago.
Brown, Arthur W., Major, 2022 Montrose Ave., Chicago.
Bullock, Weldon K., Lt. Col., 5052 Maine, N. Chicago.
Burkhart, George H., Capt., 605 W. 6th St., Benton.
Burkhart, Jean M., Capt., 406 S. Main St., Benton.
Butler, William J., Capt., 203 Pennsylvania, Urbana.
Curtis, William W., Capt., 303 E. Superior St., Chicago.
Endres, Fred C., Lt. Col., 3511 Prospect Rd., Peoria Heights.
Erenburg, Leon M., Major, 420 Wrightwood Ave., Chicago.
Gardner, Leon P., Major, St. Charles Hosp., Aurora.
Hanford, Roy E., Capt., Cook County Hosp., Chicago.
Hanson, Martin F., Major, 315 N. Orange St., Havana.
Illyes, Roscoe O., Major, Lawrenceville.
Jedicka, Frank L., Capt., 5313 West 25th St., Cicero.
Kennedy, Richard L., Major, 2440 Lakeview Ave., Chicago.
Lavieri, Frank J., Major, 500 Addison St., Chicago.

Illinois—Continued

Leventhal, Michael L., Lt. Col., 924 Hyde Park, Chicago.
McKinley, H. A., Lt. Col., 597 Glenview Ave., Highland Park.
McLean, Franklin C., Lt. Col., 5545 University Ave., Chicago.
MacDonald, Hugh, Lt. Col., R.R. 1, Glenview.
Malow, Louis, Capt., 424 Oakdale Ave., Chicago.
Menaker, Gerald J., Lt. Col., 6201 S. Hermitage Ave., Chicago.
Monroe, Clarance W., Lt. Col., 837 Hayes Ave., Oak Park.
Murfin, Maurice D., Major, 312 S. McClellan, Decatur.

Indiana

Ake, Loren F., Major, 102 Mulberry St., Cambridge City.
Beams, Ralph H. C., Capt., 127 E. Washington St., Fairmount.
Boren, Paul R., Capt., Poseyville.
Carrel, Francis E., Major, Country Club Park, Lebanon.
Fox, Francis H., Capt., 417 Division St., Bicknell.
Geider, Roy A., Capt., 943 Arlington Ave., Indianapolis.
Glock, Maurice E., Lt. Col., 1913 Forest Park, Ft. Wayne.
Holdeman, Richard W., Capt., 404 LaFayette Blvd., South Bend.
Hummel, Russel M., Capt., Rural Route 1, Marion.
Humphreys, Joe E., Capt., Indianapolis City Hosp., Indianapolis.
Inlow, Herbert H., Major, 212 N. Harrison, Shelbyville.
King, Peter C., Major, Swayzee.
Lasalle, Robert M., Lt. Col., 442 N. Wabash St., Wabash.
Libnoch, Casimir L., Capt., 404 S. Chapin St., South Bend.
McElroy, James S., Major, 1230 Audubon Rd., New Castle.
Mericle, Earl W., Major, 1040 N. Delaware St., Indianapolis.
Montagnino, Joseph F., Capt., 2023½ N. St., Logansport.

Iowa

Almquist, Reuben. E., Capt., Albert City.
Bjork, Floyd J., Capt., Keota.
Brody, Sidney, Lt. Col., 228½ E. Main St., Ottumwa.
Burbridge, Glen E., Major, Logan.
Egbert, Daniel S., Major, 23 W. 5th St., Atlantic.
Entringer, Albert J., Capt., 585 Seminary St., Dubuque.
Giegerich, Walter F., Major, 1790 Grace St., Dubuque.
Houlihan, Francis W., Capt., Box 394, Ackley.
Kaplan, David, Capt., 203 Terrace Apartments, Sioux City.
Keith, John J., Major, 1184 11th St., Marion.

Kansas

Allen, Max S., Major, Univ. Kans. Hosp., Kansas City.
Ashley, George L., Capt., 211 W. Main, Chanute.
Carlson, Marlin W., Major, Ellinwood.
Fisher, James B., Capt., 419 N. Pinecrest, Wichita.
Fry, Gerald A., Capt., Wichita Hosp., Wichita.
Gale, Norman A., Capt., 1185 College Ave., Topeka.
Grosjean, Wendell A., Major, Winfield.
Kelley, George M., Capt., Lake City.
Kuhn, W. F., Major, 5312 Belinder Rd., Route 5, Kansas City.
McConchie, James E., Capt., 109 E. 4th St., Washington.

Kentucky

Baker, Simeon S., Capt., U. S. Coal Coke Co., Lynch.
Bradbury, John W., Capt., Shepherdsville.
Bradshaw, Wilbur V., Major, Box 185, Stanford.
Clinton, Harley W., Major, 620 Main St., Williamsburg.
Garrett, Evan LaR., Major, 1409 Olive Blvd., Murray.
Gordinier, John D., Capt., 806 Heyburn Bldg., Louisville.
Guerrant, Edward O., Capt., 217 Main St., Winchester.
Handley, John D., Lt. Col., Hodgenville.
Lowrey, George E., Capt., Harrodsburg.
Lucas, Marvin A., Major, 2721 Dumesnil St., Louisville.
McKee, Willis P., Capt., Eminence.

Louisiana

Brocato, Joseph M., Capt., 4630 Banks St., New Orleans.
Brownell, Charles R. Jr., Capt., Morgan City.
Chauvin, Eustace V., Capt., 309 Jefferson Blvd., Lafayette.
Coyle, Elda S., Major, Plain Dealing.
McElwee, Newell E. Jr., Capt., Crowville.
McFarland, O. W., Major, 498 Lake Shore Dr., Baton Rouge.

Maryland

Brown, Manuel, Capt., 3635 Reisterstown Rd., Baltimore.
Cockerham, H. L. Jr., Capt., Bon Secours Hosp., Baltimore.
Gerwig, Walter H. Jr., Lt. Col., Oak Pl., N. Charles, Baltimore.
Knauf, George M., Major, Rising Sun.
Lusby, Frank F., Capt., 170 W. Washington, Hagerstown.
Mackowiak, S. C., Capt., 2912 Dunmurry Rd., Apt. B, Dundalk.
Muir, Bennett W., Capt., 302 Southway, Baltimore.

PHYSICIANS SEPARATED FROM SERVICE

ARMY MEDICAL CORPS OFFICERS RECOMMENDED FOR/OR RELIEVED FROM ACTIVE DUTY

Name Rank Address

Massachusetts

Austen, George Jr., Lt. Col., 21 Hawthorn Rd., Brookline.
Badger, Theodore L., Lt. Col., 45 Cedar Rd., Chestnut Hill.
Dame, Lawrence R., Major, 9 Orchard St., Greenfield.
Dashef, Oscar A., Major, 39 Greycliff Rd., Brighton.
Durant, John E. C., Major, 564 Union St., New Bedford.
Gurwitz, Jack, Major, 97 St. Paul St., Brookline.
Harrison, John H., Lt. Col., 49 Monmouth St., Brookline.
Henderson, John W. Jr., Major, 766 Pleasant St., Worcester.
Hoobler, Sibley W., Capt., 306 Riverway, Boston.
Jacobs, Harry, Capt., 95 Thoreau St., Concord.
Kilham, Lawrence, Capt., 42 Cedar St., Boston.
Leonard, Field C., Capt., Shore St., Falmouth.

Michigan

Appel, Ben A., Capt., Standish.
Birch, William G., Major, 334 E. Spruce St., Sault Ste. Marie.
Carpenter, William S., Capt., 611 Wilcox St., Dearborn.
Crawford, Kenneth L., Major, 1532 Grand Ave., Kalamazoo.
Culver, Dean T., Capt., 72 Division St., Coldwater.
Falick, Mordecai L., Major, 15141 Plymouth Rd., Detroit.
King, Frank A. Jr., Capt., 2100 Colfax, Benton Harbor.
Loranger, Guy L., Major, 1022 Yorkshire Rd., Grosse Pointe.
McCaulty, Morris D., Major, 12341 Stoepel, Detroit.
Miller, Harold A., Major, 218 S. Ann Arbor St., Saline.

Minnesota

Cochrane, B. B., Lt. Col., 1169 Rice St., St. Paul.
Delmore, John L. Jr., Capt., Roseau.
Doman, Victor W., Capt., Lakefield.
Farsht, Irving J., Lt. Col., 1419 W. 27th St., Minneapolis.
Fleshe, Bernard A., Major, Lake City.
Gleason, Wallace A., Lt. Col., 88 N. Cleveland Ave., St. Paul.
Johnson, Allen G., Major, 224½ E. Second St., Hastings.
Karn, Jacob F., Major, Ortonville.
Kettlewell, Ralph B., Lt. Col., Sauk Centre.
Korda, Henry A., Capt., 902 109th Ave., W. Duluth.
Mavtun, Charles K., Lt. Col., 1233 1st St., S. W., Rochester.
Milligan, Arthur M., Lt. Col., Iron Exchange Bldg., Brainerd.

Mississippi

Canizaro, Vito J., Major, 1301 Washington St., Vicksburg.
Chambers, Wallace L., Major, Pickens.
Collum, Tillman B., Captain, Golden.
Freedman, Harold D., Major, Senatobia.
Johnson, Vilhelm M., Major, Dawson.

Missouri

Barker, Lawrence F., Capt., 6240 Rosebury St., St. Louis.
Cook, Robert J., Captain, 7068 Maryland, St. Louis.
Duckett, Thomas G., Major, Sheldon.
Elliott, William H. J., Capt., City Hosp., St. Louis.
Forsythe, Robert W., Capt., U. of Kansas City.
Grossman, Marvin, Major, 5845 A Terry Ave., St. Louis.
Growdon, John A., Major., 622 W. 67th St., Kansas City.
Harless, Morris S., Major, 6844 Cherry St., Kansas City.
Harrington, Paul R., Major, General Hospital, Kansas City.
Harwell, J. Lester, Major, 201a S. Main St., Poplar Bluff.
Hogg, Garrett Jr., Major, Cabool.
Lundgren, Fred H. Jr., Major, 432 W. 67th St., Kansas City.
McIntire, Landon R., Capt., 216 N. Main St., St. Charles.
Mulliniks, Edward C., Major, Caruthersville.

Montana

Duchesneau, Fernand P., Capt., 912 W. Diamond St., Butte.
Hynes, John E., Major, Rimrock Rd., Billings.
Lindstrom, Everett H., Major, 850 Helena Ave., Helena.

Nebraska

Anderson, M. F., Major, 509 Wood Ave., Carter Lake, Omaha.
Day, Robert J., Major, 2711 N. 55th St., Omaha.
Eaton, Wilbur S., Capt., 419 N. 9th St., Plattsmouth.
James, Louis D., Lt. Col., Oxford.
Kuncl, Joseph Jr., Lt. Col., 1012 Larmie St., Alliance.

New Jersey

Balogh, William A., Capt., 315 Front St., Dunellen.
Bartolini, Frank J., Major, 356 Grant St., Phillipsburg.
Betts, Richard W., Capt., 22 N. Main St., Medford.
Black, Max S., Capt., 1320 St. George Ave., Linden.
Boselli, Emile H., Capt., 614 15th St., Union City.

New Jersey—Continued

Brodkin, Henry A., Lt. Col., 365 Osborne Terrace, Newark.
Cunningham, Joel B., Major, 801 Cooper, Camden.
De Marco, Silverino V., Capt., 1818 Boulevard, Jersey City.
Dodge James T., Capt., 1819 S. Broad St., Trenton.
Douglas, Frederick W., Capt., 21 Central Ave., Montclair.
Fager, Rudolph O., Capt., 53 Park Pl., Bloomfield.
Golden, Clement H., Capt., 109 Weequahic Ave., Newark.
Jacobs, William, Capt., 1013 Clinton Ave., Irvington.
Karshmer, Nathan, Capt., 131 N. 6th Ave., Highland Park.
Leonard, Bernard F., Major, 307 Salem Ave., Burlington.
Marguilies, Charles, Major, 188 High St., Nutley.
Marrocco, William A., Major, 47 Ward St., Paterson.

New York

Ayer, Wardner D., Lt. Col., 614 University Ave., Syracuse.
Bajohr, Albert, J., Major, 160-19 Sanford Ave., Flushing.
Bednarkiewicz, I. A., Major, 972 Francis Ave., Schenectady.
Berger, Julius M., Major, 5630 Fieldston Rd., New York.
Blauvelt, Willard J., Capt., Port Byron.
Bleichfeld, Samuel, Lt. Col., 119 Highland Ave., Buffalo.
Cacioppo, Joseph J., Capt., 1030 Greene Ave., Brooklyn.
Cantor, Milton, Capt., 239 Hart St., Brooklyn.
Cantor, Philip J., Capt., 1417 Ave. K, Brooklyn.
Carroll, Hubert F., Capt., Indian Lake, Hamilton County.
Cassebaum, William H., Major, 229 E. 79th St., New York.
Chasen, William H., Major, 697 Green Ave., Brooklyn.
Danforth, Edward P., Major, 33 River St., Sidney.
Davis, John Staige, Jr., Lt. Col., 135 E. 65th St., New York.
Dolce, Joseph R., Major, 496 Swan St., Buffalo.
Fairchild, Robert, Capt., 26 E. Main St., Marathon.
Farr, Richard S., Lt. Col., 207 Clarke St., Syracuse.
Frank, Joseph J., Major, 121 Wilson St., Syracuse.
Goffen, Bernard S., Capt., 518 Monroe St., Brooklyn.
Hefter, Maxwell S., Capt., 126 N. Main St., Spring Valley.
Hindson, George N., Capt., 4 Norton St., Jordan.
Hun, Henry H., Lt. Col., 149 Washington Ave., Albany.
Jacobs, Matthew H., Capt., 1422 Park Place, Brooklyn.
Jasper, Harry, Capt., 737 Madison Ave., Albany.
Katz, Joseph, Capt., Lyons Falls.
Kelly, Miles W., Capt., Main St., Avoca.
Kiely, James A., Lt. Col., 2 Tremont Ave., Binghamton.
Kneeland, Yale Jr., Col., 33 East 70th St., New York.
Korn, Samuel M., Capt., 4217 Sea Gate Ave., Brooklyn.
Kroehler, Robert A., Capt., 137-10 241st St., Rosedale, L. I.
Kunkel, Robert S., Capt., 20 1st Ave., Gloversville.
Lasner, Jack, Major, 1233 44th St., Brooklyn.
La Sorsa, Francis P., Major, 44 W. 9th St., New York.
Levbarg, John J., Major, 1523 Madison Ave., New York.
Levinson, Leonard J., Major, 79 Sunnyside Ave., Brooklyn.
Lombardi, Anthony L., Major, 33 Jackson St., Little Falls.
McGowan, John F., Capt., 550 Forest Ave., Buffalo.
McIver, Monroe A., Major, 32 Fair St., Cooperstown.
MacFee, William F., Col., 1215 5th Ave., New York.
Mancuso, Natale P., Capt., 136 Hampshire St., Buffalo.
Maurer, John H., Capt., 470 Raymond Ave., Rockville Center.
Meister, Peter C., Major, 144 Durham Ave., Buffalo.
Merrill, Frederick H., Capt., 445 E. 84th St., New York.
Meyers, Douw S., Major, 44 Maiden Lane, Kingston.
Mira, Anthony A., Capt., 25-11 42 St., Astoria.

North Carolina

Cornell, William S., Lt. Col., Medical Bldg., Charlotte.
Floyd, Anderson G., Capt., Whitebille.
Hawes, George A., Capt., 1629 Providence Rd., Charlotte.
Hunt, Walter S. Jr., Capt., Rex Hosp., Raleigh.
McIntosh, Donald M., Jr., Major, Marion.
Melcher, Willis A., Capt., Woodard-Herring Hosp., Wilson.

Ohio

Archer, M. C., Major, 140 W. Washington St., Medina.
Baird, Warren A., Major, 2050 Parkside Blvd., Toledo.
Berger, Peary B., Capt., 215 S. Main St., Englewood.
Bolton, Ralph D., Major, Mercy Hospital, Canton.
Braumbaugh, J. J., Lt. Col., 626 Walnut Ave., N.E., Canton.
Bunin, Simon, Capt., 10108 Hampden St., Cleveland.
Calo, Frank J., Capt., 12301 Forest Ave., Cleveland.
Cunningham, Walter A., Major, 401 Market St., Steubenville.
Dameron, Wesley P., Capt., 6624 Parkland Ave., Cincinnati.
Danchik, Sol A., Capt., 708 Bedford Pl., Columbus.

PHYSICIANS SEPARATED FROM SERVICE

ARMY MEDICAL CORPS OFFICERS RECOMMENDED FOR/OR RELIEVED FROM ACTIVE DUTY

Name Rank Address

Ohio—Continued

Dole, John Addis Jr., Major, 713 Center St., Ironton.
Dunn, David D., Capt., Cleveland Clinic Found., Cleveland.
Eckstein, Richard W., Capt., Lakeside Hosp., Cleveland.
Edelstein, Joseph B., Major, 638 Winthrop St., Toledo.
Ferraro, William R., Major, 1211 26th St., Canton.
Freedman, Mark A., Lt. Col., 74 W. Ninth Ave., Columbus.
Fritz, Ward A., Major, 901 W. Liberty St., Wooster.
Gallen, John J., Major, 262 Sherborne Dr., Columbus.
Gettman, Robert L., Major, 723 Mt. Vernon Ave., Marion.
Hanger, Irwin C., Major, University Hospitals, Cleveland.
Harris, Frank H., Capt., 918 Zane Highway, Martins Ferry.
Humphries, John K., Major, P.O. Box 236, Belle Center.
Jennings, William M. J., Major, 5693 N. Main St., Sylvania.
Johnson, Festus A., Major, 7 W. Bowery St., Akron.
Kaplan, Ronald R., Major, 2123 Remock Rd., Cleveland Hts.
Kolb, Thomas V., Major, Chillicothe St., South Charleston.
Kreindler, Louis, Major, 710 Greenwood Ave., Cincinnati.
Lawrence, Leslie L., Major, 245 22d St., N.W., Canton.
Lazzari, John H., Lt. Col., 1701 Republic Bldg., Cleveland.
Limbacher, Henry P., Major, 15701 Detroit Ave., Lakewood.
Mansfield, Robert D., Major, 117 Park Ave., S.W., Canton.
Marcus, Louis L., Major, 1924 Consaul St., Toledo.
Marshall, John H., Lt. Col., 225 W. Sandusky St., Findlay.
Montgomery, Edward L., Major, Seyfert Ave., Circleville.

Oklahoma

Curry, John R., Major, Blackwell.
Ellison, Gayfree Jr., Capt., 538 Chautauqua, Norman.
Fowler, Arthur Jr., Major, 1227 W. Wynnewood St., Sulphur.
Hamm, Leslie T., Major, 2309 N.W. 25th St., Oklahoma City.
LeHew, Elton W., Lt. Col., Pawnee.
Livingston, Lawrence G., Lt. Col., 408 Summit, Lawton.
Miles, John B., Major, 501 W. Georgia, Anadarko.

Oregon

Durno, Edwin R., Major, 1913 Hillcrest Rd., Medford.
Gentle, Hjalmar T., Lt. Col., 19-S. Barneburg Rd., Medford.
Kerby, Kenneth E., Capt., Nyssa.
Menkel, Carlson B., Capt., 888 Main St., Sheridan.

Pennsylvania

Ajac, John C., Major, 115 Carlisle St., Hanover.
Averill, Roy S. Jr., Capt., 726 Wills St., Mt. Washington Sta.
Beerman, Curtis A., Major, 2801 Fourth Ave., Altoona.
Benson, Paul J., Major, 502 W. Mahoning St., Punxsutawney.
Blair, Albert J., Major, 77 S. Morris St., Waynesburg.
Brown, Albert W., Major, 278 N. Lansdowne Ave., Lansdowne.
Butler, William S., Capt., 14½ Main St., Wellsboro.
Campbell, Joseph L., Lt. Col., Ulster.
Caplan, Milton L., Capt., 710 Park Ave., Ellwood City.
Cappola, Michael T. Jr., Major, 312 Wharton St., Philadelphia.
Dalrymple, Richard Y., Major, Hanover GH, Hanover.
Dawe, George Griffith, Major, 39 N. Main St., Mifflintown.
Fawcett, Robert M., Capt., Magee Hosp., Pittsburgh.
Friend, Arthur, Capt., 422 Main St., Dupont.
Goldberg, Louis, Capt., 516 Franklin Ave., Phoenixville.
Gowen, Leo F., Capt., 2538 W. Diamond St., Philadelphia.
Hampton, Louis Jennings, Lt. Col., 500 Queen St., Stroudsburg.
Harnish, Robert L., Major, 102 South 4th St., Denver.
Hopewell, Edward L., Major, 101 High St., Strasburg.
Humphrey, Harold I., Major, Slippery Rock.
James, Alfred E., Capt., Beavertown.
Katz, Albert H., Capt., 2 Heinz Terrace, Sharpsburg.
Katz, Martin E., Major, 100 E. Market St., Mount Union.
Kaufman, Harry, Capt., 385 Norris, Sharon.
Kaufman, Irwin L., Capt., 1529 Beechview Ave., Pittsburgh.
Kenny, Clare C., Capt., Fifth St., Matamoras.
Klingensmith, Paul O., Major, 507 N. Latch's Lane, Merion Sta.
Knoll, George M., Capt., Allentown Hosp., Allentown.
Krajeski, D. S., Capt., 61 N. Washington St., Wilkes-Barre.
Large, John S., Major, 207 S. Center Ave., Somerset.
Lyon, Edward Jr., Major, 804 Hawthorne Ave., Williamsport.
Margotta, Victor J., Capt., 137 E. Pine St., Dunmore.
Mateer, Eugene H., Capt., State Col. Pa., 141 S. Beaver Ave.
Morrocco, John D., Major, 116 E. North Ave., N.S., Pittsburgh.

Rhode Island

Curren, Levi A., Capt., 789 Park Ave., Cranston.
Gordon, John H., Major, 68 Oswald St., Pawtucket.
Jones, Walter S., Major, 165 Waterman St., Providence.

Rhode Island—Continued

Lawson, Herman A., Col., 12 Everett Ave, Providence.
Malone, John M., Capt., Quaker Hill, Portsmouth.

South Carolina

Finger, Elliott, Major, Marion.
Hanahan, Ralph B., Major, Florence.
Holt, Benton B. Jr., Major, Roper Hosp., Charlestown.
King, Lebby B., Capt., 215 E. Main St., Lake City.
MacLaughlin, William T., Major, Route 1, Chester.

South Dakota

Bliss, Robert J., Major, 1325 W. 12th St., Sioux Falls.
Bloemendaal, Gerrit J., Major, Ipswich.
Larisey, Carr T., Major, P. O. Box 42, Hampton.

Tennessee

Akin, Robert L., Capt., Monterey.
Avent, Charles H., Lt. Col., 1594 Vinton Ave., Memphis.
Brannen, Frank S., Capt., 1810 Chamberlain Ave., Chattanooga.
Brown, Robert H., Capt., 120 Center St., Kingsport.
Byars, Stevens, Major, Spring Creek.
Dreibelbis, William H., Capt., Milton Ave., Chattanooga.
Frazier, John W. Jr., Major, 928 Broad St., Nashville.
McPeake, William T. Jr., Capt., Morris Chapel.

Texas

Allamon, Emmett L., Major, Parkland Hosp., Dallas.
Beaver, Norman B., Major, 4329 Fairfax, Dallas.
Crawford, John McC., Capt., Carrizo Springs.
Duncan, Robert W., Major, 400½ College, Ft. Worth.
Good, Wealty W., Capt., c/o So. Texas Nat. Bk., San Antonio.
Guerra, Gilberto A., Capt., 422 E. Van Week St., Edinburg.
Hopper, John J., Capt., Stanton Clinic Hosp., Stanton.
Jones, Malcolm A., Col., Box 272, Hempstead.
Lehmann, Cornelius F., Col., 336 Terrell Rd., San Antonio.
Lerner, Ben L., Capt., 507 E. Mulberry St., San Antonio.
McKee, Robert D., Major, St. Joseph Hosp., Fort Worth.

Utah

Clark, John H., Major, U. S. Bank Bldg., Vernal.

Vermont

Emerson, Burton L., Major, Johnson.
Harwood, Clifford B., Capt., Rupert.

Virginia

Boyce, Oren D., Capt., Rural Retreat.
Easley, Charles A. Jr., Capt., 326 Robertson Ave., Danville.
Ely, Thomas S., Capt., Box 194, Jonesville.
Hurt, Holcombe H., Lt. Col., 31 Columbia Ave., Lynchburg.
Hurt, Ira H., Col., 418 Greenwood Rd., Roanoke.
McFadden, Roscoe I., Capt., Riverside Hosp., Newport News.
Manson, Richard C., Major, 111 Seneca Rd., Richmond.

Washington

Franz, Francis W., Major, 5018 E. 41st St., Seattle.
Graham, Kenneth D., Major, 1015 North I St., Aberdeen.
Hunter, Maxwell R., Major, 404 Capitol Way, Olympia.
Jarvis, Fred J., Capt., 635 38th Ave., Seattle.

Washington, D. C.

Greear, J. N. Jr., Lt. Col., 3532 Edmunds St., N.W., Washington

West Virginia

Ashworth, Harold B., Capt., 906 Third St., Moundsville.
Bradford, Bert J., Lt. Col., Medical Arts Bldg., Charleston.
Brown, James D., Capt., Romney.
Friedman, Norman, Major, Longacre.
Martin, Joseph E. Jr., Major, 420 Davis St., Elkins.
Moore, Bernard J., Capt., Carolina Ave., Chester.

Wisconsin

Glynn, James D., Major, 437 W. Hickory St., Lancaster.
Kocovsky, Clarence J., Capt., 6219 W. Lloyd St., Wauwatosa.
Little, William W., Capt., Washington Island.
Lochen, Everette L., Major, 233 South St., Waukesha.
Middleton, William S., Col., 2114 Adams St., Madison.

MISCELLANEOUS

HOSPITAL WORKERS NEEDED

More than 130,000 professional and nonprofessional workers, in addition to more trained volunteer nurses' aides, are needed in the nation's civilian hospitals. The Public Health Service of the Federal Security Agency, the War Manpower Commission and the Veterans Administration are sponsoring a recruiting drive in cooperation with the American Red Cross, the National Nursing Council for War Service and the American Hospital Association. Urgently needed at once are 30,000 graduate nurses for general, tuberculosis and psychiatric hospitals, 8,000 graduate nurses for public health nursing, 2,000 graduate nurses for Veterans Administration hospitals (this is in addition to 3,000 more who will be needed by January 1947) and 90,000 non-nursing hospital workers. Besides these paid workers, 40,000 already trained volunteer nurses' aides are needed to augment the number now giving many hours of service to the hospitals.

Within a few months large numbers of nurses released by the military services and closed war plants may transfer their services to hospitals, but no appreciable increase in the number of women taking such positions is expected immediately. Of the 13,000 industrial nurses, many are expected to remain in the industrial field. Of the Army and Navy nurses released, it is expected that many will take well deserved rests before they take up new duties in civilian hospitals or as private nurses. The first classes of cadet nurses, now in training, will not become graduate nurses until next July. The need for the additional nurses is due to the patient load, which is heavier today than at any time since 1940, as well as to the withdrawal in the past of nurses for the armed services and war plants.

At the request of the Surgeon General the Public Health Service, the American Hospital Association recently conducted a survey to learn the extent of personnel shortages and to determine the seriousness of the need. The survey, which covered 1,060 hospitals affiliated with the association, reported that 23 per cent had closed beds, wards and sections as a result of the shortage of nurses and other personnel. Hundreds of hospitals still have long waiting lists of patients requiring hospitalization. This is in spite of the fact, the survey report stated, that many nurses are working longer shifts and most of them under unwholesome tension.

Hospitals are crowded more than ever for three principal reasons, the Office of War Information was told: 1. Higher incomes and hospitalization plans have made hospital care financially possible for many who could not previously afford it. 2. The population is growing: babies born in hospitals increased from 1,214,492 in 1940 to 1,919,976 in 1944. 3. An overworked doctor can attend more patients when they are brought together in one hospital under professional nursing care than if left in scattered homes. The trend has been strongly in this direction.

The association survey disclosed that in 1944 general hospitals with schools of nursing attached were able to provide patients only thirty-five minutes care by graduate staff nurses every twenty-four hours, or about half the minimum. The remainder of the care was given by student nurses. To supplement nursing staffs in these hospitals 30,000 more nurses are needed, according to the survey. The recommended care for a patient during a twenty-four hour period (under wartime conditions) in a general hospital without a school of nursing is two and one-half hours. However, in 1944 only one hour and ten minutes per day was available to patients.

The shortage of nurses was said to be even more acute in tuberculosis and psychiatric hospitals. There has been a decrease of 31.3 per cent since 1941 in the number of nurses employed in nonfederal psychiatric hospitals. There are now 4,277 nurses caring for 537,821 patients, or only 1 nurse to care for 125 mentally ill patients. There has been a decrease of 36.7 per cent in the number of nurses employed in tuberculosis hospitals since 1941. This means that 4,284 nurses are caring for 58,610 patients, almost 14 to 1 nurse.

The Veterans Administration reports that the ninety-eight veterans' hospitals are for the most part understaffed to the danger point. There are three types of veterans' hospitals: general medical and surgical, neuropsychiatric and tuberculosis. The need for 8,000 more public health nurses is based on a wartime standard of 1 nurse to 5,000 people for every state. At present there is 1 nurse for each 6,000 population. Vast shifts in population as families moved into war industry centers or followed service men around the country created new needs for public health nurses, the Public Health Service reported. About 3,000 public health nurses have gone into military service. Many of these vacancies have remained unfilled. The 90,000 more men and women—other than nurses or nursing personnel—who are needed include highly skilled technicians, orderlies, laundrymen, electricians, plumbers, janitors and chefs.

More than 200,000 women in the United States have completed nurses' aide training, but for a variety of reasons many of them are not now devoting any time to hospitals. It is probable, the Red Cross states, that some hospitals already have a full complement of volunteers. However, many hospitals are pleading for them. The Red Cross also said that a minimum of 3,000,000 additional persons should receive training in home nursing. Four types of courses are offered: (1) a standard twenty-four hour course for adults, (2) six two hour lessons in the care of the sick, (3) the course for college students, offered in the fall of this year, (4) the high school course, which is sometimes combined with home economics or science courses.

WARTIME GRADUATE MEDICAL MEETINGS

The sudden termination of active hostilities in both Europe and Japan, with the resultant anticipated redeployment and separation of physicians from service, has compelled the Central Committee to make preparations for the conclusion of the Wartime Graduate Medical Meetings. Unless more urgent demands are forthcoming, its activities will terminate as of Dec. 31, 1945.

The following subjects and speakers for Wartime Graduate Medical Meetings have just been announced:

California

Birmingham General Hospital, Van Nuys: Recent Developments in Surgical and Public Health Antisepsis, Dr. Fred J. Moore, October 10; Communicable Diseases, Major Norman Nixon, October 24; Acute Infectious Mononucleosis, Capt. Charles H. Marple, October 24.

A. S. F. Regional Hospital, Camp Haan: Neuropsychiatry, Lieutenant Commander Nichols, October 2.

Camp Cooke Station Hospital, Lompoc: Recent Developments in Diabetes, Dr. Howard F. West, October 3; Traumatic Surgery of the Urinary Tract, Capt. D. W. Atcheson, October 17.

Hoff General Hospital, Santa Barbara: Recent Developments in Diabetes, Dr. Howard F. West, October 3; Traumatic Surgery of the Urinary Tract, Capt. D. W. Atcheson, October 17.

Torney General Hospital, Palm Springs: Cardiac Pain, Capt. Arthur A. Twiss, October 2; Acute Nephritis, Professor Lyttle, October 16.

U. S. Regional Hospital, Pasadena: Thoracic Surgery, Comdr. W. L. Rogers, October 8.

U. S. Naval Air Training Station, San Diego: Acute Infectious Hepatitis, Col. Irving Wright, October 5; Psychosomatic Medicine, Major Milton Miller, October 19; Headache, Capt. Oscar Sugar, October 19.

A. A. F. Regional and Convalescent Hospital, Santa Ana Army Air Base: The Streptococcus Problem, Lieut. Comdr. George R. Underwood, October 2; Endocrinology, Dr. Hans Lisser, October 18.

U. S. Naval Hospital, San Diego: Peripheral Vascular Problems, Col. Irving Wright, October 4.

U. S. Naval Hospital, Mare Island: Newer Trends in Syphilotherapy, Dr. Norman N. Epstein, October 5; Acute Sinusitis, Dr. Lewis F. Morrison, October 26.

U. S. Naval Hospital, Treasure Island: Skeletal Injuries to the Extremities, Dr. Frederick C. Bost, October 5; Peritoneal Injuries and Infections, Dr. Alson R. Kilgore, October 26.

Station Hospital, Camp Roberts: Peripheral Vascular Disease; Surgical Aspects, Dr. M. Laurence Montgomery, October 13.

ORGANIZATION SECTION

Washington Letter

(From a Special Correspondent)

Sept. 17, 1945.

General Hawley Named Veterans Surgeon General

In his reorganization of the Veterans Administration along army lines, with thirteen branch offices set up in districts roughly comparable to Army Service Commands, Gen. Omar N. Bradley has named Major Gen. Paul R. Hawley as the agency's acting Surgeon General. Dr. Charles M. Griffith, medical director, becomes an assistant to General Hawley. The Medical Branch has also been raised to independent status.

A. D. Hiller, formerly executive assistant to the administrator, also will assist General Hawley in handling administrative affairs. General Bradley has appointed Col. Eldon L. Bailey, recently released from the Army, to be his executive assistant, with duties to be roughly those of a chief of staff. Decentralization is effected through creation of the thirteen branches, which will supervise the work of fifty-three existing offices and about one hundred hospitals, formerly run from the Washington central office. Control of the agency will also be distributed among fourteen top assistants to General Bradley. During the two decade administration of Brig. Gen. Frank T. Hines, control was held by four deputy administrators, the so-called Four Horsemen. All four have been held in key posts, the shakeup leaving old time appointees in ten of the top jobs. General Bradley declared that all appointees, civilian and military, are in an "acting capacity" and none of the appointments are permanent.

Major General Hawley is named assistant administrator for medicine and surgery. Formerly chief surgeon of the European theater, he has been serving as personal aide on medical affairs to General Bradley and will now serve as "surgeon general." The director of medical and hospital service served in the former setup under a civilian who was the assistant administrator in charge of medical and domiciliary care, construction and supplies. Now an almost autonomous medical branch is created, as requested in bills before both branches of Congress and urged by elder statesman Bernard Baruch.

The thirteen branches will be established as soon as personnel are trained and space is available. They take immediate charge of hospitals, domiciliaries and regional and subregional officers. Later they will handle insurance and dependents' claims now handled by the central office.

Congress Urged to Aid Research on Artificial Limbs

Col. Leonard T. Peterson, Army chief of orthopedic surgery, told the House Labor Committee's subcommittee to aid the physically handicapped, that failure of Congress to support research in better artificial limbs will mean that limbs will be no better twenty-five years hence than they are now. He was one of a number of witnesses heard during three day hearings before Representative Augustine B. Kelley, Democrat of Pennsylvania, subcommittee chairman.

Denial of Deaths from Delayed Radioactivity of Atomic Bomb

Scientists who developed the atomic bomb deny Japanese propaganda claims that delayed radioactivity could have caused deaths. They state that the radioactive gamma rays released by the atomic bomb may kill instantly or cause death within a few days. These gamma rays will penetrate an ordinary wall, but a foot of concrete stops them. The rays travel with the speed of light. Some atomic bomb victims in Hiroshima and Nagasaki were doubtless killed by instantaneous radiation at the time of the explosion. But these instant rays are not to be confused with delayed radioactivity. Major Gen. Leslie R. Groves, director of the atomic bomb project, says that the atomic bomb will actually kill in some fifteen different ways, including concussion, blast, fire, exploded missiles, falling buildings and lack of medical attention. United States Army scientific observers were flown to Japan after the surrender to check on bomb damage and the Jap propaganda claims.

Medical Legislation

MEDICAL BILLS IN CONGRESS

National Neuropsychiatric Institute

Hearings have been scheduled by a subcommittee of the House Committee on Interstate and Foreign Commerce on H. R. 2550, a bill to provide for, foster and aid in coordinating research relating to neuropsychiatric disorders and to establish the National Neuropsychiatric Institute. Hearings began Tuesday, September 18.

Prosthetic Appliances

Representative Rogers, Massachusetts, proposes by H. R. 4011 to direct the Secretary of War to cause to be conducted, by the appropriate agency or agencies in the War Department, experimentation, studies and research for the purpose of aiding in the rapid development and prompt manufacture of more adequate and efficient prosthetic appliances and parts of such appliances. This bill, too, would direct the Secretary of War to allocate funds to such corporations and business firms as he deems best qualified, to be expended in conducting experimentation, studies and research with respect to prosthetic appliances. Another bill introduced by Representative Rogers, H. R. 4012, is similar to the preceding bill with the exception that it directs the Administrator of Veterans Affairs to cause to be conducted by the Veterans Administration such experimentation and directs that official to allocate funds to corporations and business firms.

Miscellaneous

Representative Kelley, Pennsylvania, has introduced H. R. 3994, a bill to provide for the general welfare by enabling the several states to make more adequate provision for the health and welfare of mothers and children and for services to crippled children. This bill is identical with the Pepper bill, S. 1318, and the Norton bill, H. R. 3922.

H. R. 3972, introduced by Representative Bailey, West Virginia, proposes to encourage the prevention of stream pollution by allowing amounts paid for plants for the treatment of industrial waste as a deduction in computing net income.

Coming Medical Meetings

American Medical Association House of Delegates, Chicago, Dec. 3-6. Dr. Olin West, 535 N. Dearborn St., Chicago 10, Secretary.

Association of American Medical Colleges, Pittsburgh, Oct. 29-31. Dr. Fred C. Zapffe, 5 S. Wabash Ave., Chicago, Secretary.

Delaware, Medical Society of, Wilmington, Oct. 8-10. Dr. W. H. Speer, 917 Washington St., Wilmington, Secretary.

Indiana State Medical Association, French Lick, Nov. 6-8. Mr. Thomas A. Hendricks, 23 E. Ohio St., Indianapolis 4, Secretary.

Kentucky State Medical Association, Lexington, Oct. 29-31. Dr. P. E. Blackerby, 620 S. Third St., Louisville, Secretary.

New York, Medical Society of the State of, House of Delegates, Buffalo, Oct. 8-9. Dr. W. P. Anderton, 292 Madison Ave., New York 17, Secretary.

Omaha Mid-West Clinical Society, Omaha, Nebraska, Oct. 22-26. Dr. R. W. Fouts, 107 S. Seventeenth St., Omaha, Secretary.

Pennsylvania, Medical Society of the State of, House of Delegates, Philadelphia, Oct. 23-24. Dr. Walter F. Donaldson, 500 Penn Ave., Pittsburgh 22, Secretary.

Virginia, Medical Society of, House of Delegates, Roanoke, Oct. 22-23. Miss Agnes V. Edwards, 1200 Clay St., Richmond 19, Secretary.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

University News.—Dr. Paul M. Aggeler, assistant professor of preventive medicine, University of California Medical School, San Francisco, has been named assistant clinical professor of medicine and preventive medicine.

Funds for Psychiatric Clinic.—Governor Warren recently signed a bill appropriating $100,000 to purchase a site for a psychiatric clinic in Los Angeles. According to *California and Western Medicine* the clinic will be patterned after the Langley Porter Clinic established by the state in San Francisco a few years ago (THE JOURNAL, Feb. 27, 1943, p. 690). The clinic is to be devoted to research, teaching and treatment.

San Francisco Society Appoints Executive Secretary.—Mr. Frank J. Kihm, since 1938 city editor of the *Wall Street Journal,* Pacific Coast edition, has been appointed executive secretary of the San Francisco County Medical Society, a newly created position. Mr. Kihm was released from active duty with the U. S. Marine Corps September 1. He was to take up his new work with the county medical society September 15.

CONNECTICUT

Sanitary Code Amended.—A recent amendment to the Connecticut Sanitary Code, effective July 1, provides that, within twenty-four hours of the receipt of a prisoner who may have been exposed to a communicable disease, the prison or jail physician must be notified, who in turn must make a routine medical examination, including blood tests for syphilis and a smear and culture for gonococcic infection. On expiration of the sentence any person having syphilis or gonorrhea whether in an infectious or a noninfectious stage and in need of further follow-up treatment shall be reported to the state department of health. Another amendment discusses approved laboratories in using a standard serologic test for syphilis and still another states that, when the control or release of a case, contact or carrier of a communicable disease is dependent on laboratory findings, the specimens on which such findings are based shall be examined by the bureau of laboratories of the state department of health or by a laboratory specifically approved for the purpose by the state department of health. The health officer shall by himself or his agent secure and submit release cultures or specimens for examination.

FLORIDA

Wilson Sowder Named State Health Officer.—Dr. Wilson T. Sowder, U. S. Public Health Service, has been appointed health officer of Florida to succeed Dr. Henry Hanson, Jacksonville, who will retire September 25. Dr. Sowder graduated at the University of Virginia Department of Medicine, Charlottesville, in 1932. Dr. Hanson has held the position since July 1942.

GEORGIA

William Friedewald Heads New Department.—On September 1 Dr. William F. Friedewald, member of the staff, International Health Division, Rockefeller Foundation, New York, became professor of bacteriology and chairman of the newly created department at Emory University School of Medicine, Atlanta. Dr. Friedewald, who graduated at St. Louis University School of Medicine in 1935, has been with the Rockefeller Foundation since 1942.

ILLINOIS

New Chief of Health Service.—Dr. Marjorie M. Smarzo, Urbana, has been named head of the women's division of the University of Illinois Health Service, succeeding Dr. Maude Lee Etheredge (THE JOURNAL, August 18, p. 1179). Dr. Smarzo first came to the University of Illinois in 1930 as assistant hygiene and medical adviser for women. Previously she had been examining physician for the Bell Telephone Company in New York and New Jersey. In 1932 she left Illinois to become resident physician and professor of hygiene at Winthrop College, Rock Hill, S. C. Dr. Smarzo returned to the University of Illinois in 1937 and remained until 1942, when she left to become an examining physician at the Sangamon Ordnance plant at Illiopolis, Ill. In 1943 she became college physician at New Jersey College for Women, New Brunswick, N. J., returning this summer to the University of Illinois Health Service. In her new position Dr. Smarzo will have the title of assistant professor in hygiene and medical adviser for women in charge of the women's division of the health service.

Chicago

Food Forum.—On September 25 the Food Forum will convene at the Hotel Continental to hear the following speakers:

Col. Rohland A. Isker, Chicago Quartermaster Depot, Nutrition and Current Relief Feeding.
Dr. Paul R. Cannon, Relative Nutritive Values of Proteins as Influenced by Their Amino Acid Composition.
Dr. Samuel A. Levinson, Effect of Relief Protein Diet in Nutrition.

Society News.—The Chicago Laryngological and Otological Society will be addressed October 1 at the Hotel Continental by Comdr. Francis L. Lederer (MC) and Lieut. (jg) William G. Hardy, H(S), U. S. Naval Reserve, on "The Treatment and Training of the Hard of Hearing Person: A Program of Physico-Psycho-Social Therapy for Those with an Aural Handicap."

Faculty Changes at Northwestern.—Announcement was recently made of the retirement of Dr. Harry M. Richter, professor of surgery at Northwestern University Medical School, with the rank of professor emeritus. Promotions on the faculty include:

Dr. Smith Freeman, professor of physiology.
Dr. Leon Unger, associate professor of medicine.
Dr. Theophil P. Grauer, associate professor of urology.
Dr. Eugene B. Perry, assistant professor of urology.
R. Frederick Becker, Ph.D., assistant professor of anatomy.
Dr. Gerard N. Krost, assistant professor of pediatrics.

Maury Massler Goes to Italy on Medical Survey.—Maury Massler, D.D.S., assistant professor of histology in the University of Illinois College of Dentistry, became the representative of dental science in September in a medical survey of the medical effects of wartime nutritional shortages in Italy. He will take the place of Isaac Schour, D.D.S., professor and head of the histology department at the university, who is now with the medical group to organize and begin the work and who expects to return to the university October 1. Dr. Massler's leave extends from September 1 to February 1.

IOWA

New Professor of Pathology.—Dr. Emory D. Warner has been named professor and head of the department of pathology at the State University of Iowa College of Medicine, Iowa City, to succeed Dr. Harry P. Smith, who has joined Columbia University College of Physicians and Surgeons (THE JOURNAL, May 5, p. 42). Dr. Warner, associate professor of pathology at Iowa, graduated there in 1929.

Medical School Observes Seventy-Fifth Anniversary.—The State University of Iowa College of Medicine, Iowa City, will celebrate its seventy-fifth anniversary with a special program September 27-28. The program will include clinics, symposiums and ward walks as well as a series of demonstrations covering the specialties. Dr. Owen H. Wangensteen, professor of surgery, University of Minnesota Medical School, Minneapolis, will deliver the Paul Reed Rockwood Lecture on "The Ulcer Problem" and Dr. Ralph H. Major, professor of medicine, University of Kansas School of Medicine, Kansas City, the Mayo Lecture on "Hippocrates and the Island of Cos"; also included on the program will be the following, all of Iowa City:

Dr. William D. Paul, Physical Therapy in Arthritis.
Dr. William M. Hale, Influenza.
Drs. Willis M. Fowler and Milford E. Barnes, Malaria.
Dr. Elmer L. DeGowin, Blood Bank.

LOUISIANA

Personal.—Dr. Jesse F. Tanner, Bernice, has been appointed coroner of Union Parish to complete the unexpired term of the late Dr. J. G. Taylor, Farmerville, who died May 16. ——Dr. Charles F. Gelbke, Gretna, was awarded the annual plaque for outstanding civic service on the Westbank at the ninth annual banquet of the Westbank Rotary Club, held in the Gold Room of the Roosevelt Hotel, New Orleans, recently.

Grant for Study on Metabolic Diseases.—Eli Lilly and Company has made a grant of $5,000 to the Alton Ochsner Medical Foundation for research, New Orleans, for the study of endocrine and metabolic diseases under the supervision of Dr. William Parson, New Orleans. Dr. Albert Segaloff, formerly of Vanderbilt University School of Medicine, Nashville, Tenn., who was to join the foundation staff on August 1, will have direct charge of the endocrine laboratory.

MARYLAND

Charles Davidson Named Acting Professor of Radiology.—Dr. Charles N. Davidson has been appointed temporary head of the department of radiology at the University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, pending the return of Dr. Walter L. Kilby from military service. Dr. Henry J. Walton, who had been professor since 1918 until a few years ago, when he was made professor emeritus, has been serving since Dr. Kilby entered the service.

MASSACHUSETTS

Graduate Seminar in Neurology and Psychiatry.—The eleventh postgraduate seminar in neurology and psychiatry will begin Monday, October 1, at the Metropolitan State Hospital, Waltham. The program consists of lectures, demonstrations and round table conferences in anatomy, applied physiology, pathology and roentgenology of the nervous system, clinical neurology, psychopathology and psychiatry. The lectures will be held every Monday from October 1 to December 10 and from Jan. 7 to April 22, 1946 in three sessions of two hours each. The printed schedule will be released shortly. The seminar is open to all graduate physicians. Those interested are requested to register October 1 at the Metropolitan State Hospital, 475 Trapelo Road, Waltham.

MICHIGAN

State Medical Meeting.—The 1946 annual session of the Michigan State Medical Society will be held at the Book Cadillac Hotel, Detroit, the week of Sept. 22, 1946.

Rheumatic Fever Control Conference.—The Michigan State Medical Society and the Michigan Crippled Children Commission sponsored a rheumatic fever control conference September 19-20 at the Book-Cadillac Hotel, Detroit. Among the participants were:

Dr. Herman H. Riecker, Ann Arbor, The Rheumatic Fever Control Program in Michigan.
Dr. John R. Paul, New Haven, Conn., Natural History of Rheumatic Fever, Epidemiology and Familial Aspects.
Dr. Stanley Gibson, Chicago, Clinical Manifestations of Rheumatic Fever and the Determination of Rheumatic Activity.
Dr. John F. Holt, Ann Arbor, Use of the X-Rays in the Diagnosis of Rheumatic Heart Disease.
Dr. Gordon B. Myers, Detroit, Electrocardiogram in the Diagnosis of Rheumatic Heart Disease.
Dr. James L. Wilson, Ann Arbor, Differential Diagnosis of Rheumatic Fever in Children.
Dr. Joseph A. Johnston, Detroit, Chorea and Its Differential Diagnosis in Children.
Dr. Thomas Duckett Jones, Boston, Prophylaxis and Treatment of Rheumatic Fever.

In addition round table discussions were held, among others, by Drs. Moses Cooperstock and Mark F. Osterlin, Ann Arbor. The program also included clinical demonstrations.

Institute for Occupational Health Research.—Articles of incorporation for a new nonprofit corporation to be known as the Institute for Occupational Health Research will be filed in Lansing next month, it was announced September 2. The institute will be staffed with specialists in the medical and engineering phases of employee health and will maintain research laboratories. Subject to approval by the board of education, the institute will be affiliated with and housed with Wayne University's new School of Occupational Health, whose program is entirely financed by the Medical Science Center. Dr. Raymond Hussey, dean of the school, will serve as director of the institute. The sum of $750,000 is now being raised by the Medical Science Center to finance the joint program of the school and the institute for the first five years. The affiliated school and institute will be both a service unit for industry and an educational institution. The school will educate, on a postgraduate level, graduate doctors and engineers who wish to specialize in the field of occupational health. In addition, courses will be available to industrial physicians and hygiene engineers. Later the school will arrange special courses for the training of technicians. For graduate doctors and engineers the school will offer a two year course, of which half the time will be spent in plants. On graduation, doctors will receive the degree of doctor of industrial health, and engineers the degree of doctor of science in industrial health. The staff and laboratory of the institute will be available to industry at reasonable cost. In general it will concern itself with the health of all persons engaged in business and industrial occupations. It will accept a limited number of industrial concerns as clients and supervise their employee health programs, though it will at no time engage in the practice of clinical medicine. It will, on request, study the biologic effects, harmful or otherwise, of manufactured products and manufacturing processes on workers and consumers. It will conduct researches in the field of occupational health and publish and disseminate information in this field. The School of Occupational Health, meanwhile, will utilize the institute's laboratory, experiments and employee health maintenance program as part of its instruction activities, much as a hospital is used for the teaching of medical students. It is anticipated that the school will be ready to accept enrolments by the fall of 1946. The institute will be in operation before that time. For the time being, both school and institute will be situated in one of the large houses recently condemned for the use of Wayne University. Eventually a building will be provided in the Medical Science Center. Dr. Hussey is now canvassing the country for prominent medical and engineering personnel in the field of industrial health. These will comprise the faculty of the school and staff of the institute. In a statement to the press, Dr. Hussey stated that there is no institution of the kind now in existence anywhere in the world. Emphasis will be placed on the humanistic approach to the problem and the concept of occupational health which recognizes the study of health for its own sake rather than regarding health as absence of disease. Dr. Hussey stated that the staff will be prepared to go into a plant, survey it and provide full employee health supervision of both an engineering and a medical nature, making recommendations on ventilation, clothing, protective devices and all other subjects relating to employee health. The actual practice of medicine will be left to the medical profession. The institute will train industrial physicians and engineers who wish to specialize in such employee health matters as illumination, noise, ventilation, temperature and humidity, plant sanitation, hygiene and safety.

MISSOURI

Fall Clinical Conference.—The twenty-third annual fall clinical conference of the Kansas City Southwest Clinical Society will be held at the Little Theater, Municipal Auditorium, Kansas City, October 1-2. The program will consist of symposiums on:

Gastroenterology—Dr. Ira H. Lockwood, Kansas City, director; Drs. Clifford J. Barborka, Chicago; Claude F. Dixon, Rochester, Minn.; Leo G. Rigler, Minneapolis, and Col. Howard A. Rusk, M. C., participants.
Heart and Circulatory Diseases—Dr. Joseph E. Welker, Kansas City, director; Dr. Arild E. Hansen, Galveston, Texas; Capt. Alphonse McMahon (MC) and Dr. Rigler, participants.
Rehabilitation and Tropical Diseases—Dr. Lewis G. Allen, Kansas City, director; Colonel Rusk, Lieut. Col. Samuel T. Helms, M. C., and Major Wilson C. Merriman, M. C., participants.
The Chest—Dr. Herbert L. Mantz, Kansas City, director; Dr. Evarts A. Graham, St. Louis; Col. John B. Grow, M. C., and Dr. Rigler, participants.
Endocrinology—Dr. William Merritt Ketcham, Kansas City, director; Dr. Barborka, Dr. Ralph E. Campbell, Madison, Wis., Dr. Hansen and Captain McMahon, participants.
Headache and Backache—Dr. Frank D. Dickson, Kansas City, director; Dr. Campbell, Lieut. Col. Vernon L. Hart, M. C., and Dr. Roland M. Klemme, St. Louis, participants.

Other speakers who will participate include Col. Edgar V. Allen M. C., and Col. Grover C. Penberthy, M. C.

MONTANA

Personal.—Dr. Niels A. Kaa, Corvallis, has been appointed health officer of Ravalli County.

Montana Health.—The Public Health League of Montana has brought out a publication entitled *Montana Health*. The first issue, dated September, is devoted to a discussion of the health activities of the state as well as in agencies interested in the progress of health education. The Public Health League of Montana was formed last year (THE JOURNAL, Nov. 25, 1944, p. 846).

OKLAHOMA

License Revoked.—The license to practice medicine of Dr. John Henry Lee Staples, Afton, was revoked June 14 for a narcotic violation (THE JOURNAL, March 24, p. 727).

Pathologists Hold First Annual Meeting.—The Oklahoma Association of Pathologists, at its first annual meeting recently, selected Drs. Howard C. Hopps, Oklahoma City, president, Leo Lowbeer, Tulsa, vice president and Bela Halpert, Oklahoma City, secretary-treasurer. Meetings of the association have been held monthly since it was formed in December 1944.

OREGON

Dr. Aufranc Named Assistant State Health Officer.—Dr. Will H. Aufranc, a regular corps officer of the U. S. Public Health Service with rank of surgeon, is on loan to the state of Oregon to act as assistant state health officer. Dr. Aufranc also has charge of the county health units program as well as the state venereal disease control program.

Personal.—Dr. Clifford E. Hardwick, Hood River, has been named a member of the Oregon State Board of Health to succeed Dr. Thompson Coberth, The Dalles, who resigned.——Dr. Elizabeth Bishop, Baker, health officer of Union and Baker counties, was recently elected president of the Oregon Public Health Association.——William Fitch Allen, Ph.D., professor of anatomy and head of the department, University of Oregon Medical School, Portland, received the doctor of science degree from the university at its recent commencement in recognition of his contributions to anatomy and physiology and his services as a teacher.

New University Hospital Approved.—Voters of Oregon endorsed the proposed building program submitted by the legislature to aid the higher educational facilities of the state and certain state institutions coming under the jurisdiction of the state board of control, according to *Northwest Medicine*. Erection of a University Hospital on the University of Oregon Medical School campus, Portland, in addition to the existing hospitals in the university group, was among the items approved. The journal states that the house of delegates of the state medical society is on record as approving operation of such a hospital at the indigent level.

Physicians Purchase Coffey Hospital.—A group of fourteen Portland physicians has purchased the Coffey Memorial Hospital, Portland. Incorporated as Physicians and Surgeons Hospital of Portland, the new owner has declared itself a nonprofit organization and announced plans to develop a complete community hospital, according to *Northwest Medicine*. Stockholders of the new group include Drs. Johnson D. Leonard, president; Ira A. Manville and Harry M. Hendershott, vice presidents; Jerome L. Holzman, treasurer, Horace L. Rosenberg, secretary, Aubrey M. Davis, Millard B. Taylor, Waldo G. Homan, Alfred Hutchinson, Linford S. Besson, Rudolf A. Bissett, William B. Hare, Jesse L. Ray and Wilford H. Belknap.

PENNSYLVANIA

Harry Weest Named Secretary of Health.—Lieut. Col. Harry W. Weest Jr., formerly chief surgeon of the 28th division, has been appointed secretary of health of Pennsylvania to succeed Dr. Alexander H. Stewart, Harrisburg, who died July 31. Colonel Weest was commissioned a first lieutenant in the Pennsylvania National Guard in 1922 and was named division surgeon of the 28th division when Governor Edward Martin was major general in command. Colonel Weest graduated from Jefferson Medical College of Philadelphia in 1919 and practiced medicine in Altoona, where he was on the staff of the Altoona and Mercy hospitals.

Philadelphia

Committee for the Study of Pelvic Cancer.—The Philadelphia Obstetrical Society has created a committee for the study of pelvic cancer the primary aim of which is the detailed study of the "delay period" in every case of death from pelvic cancer. The plan has the approval and cooperation of the Philadelphia County Medical Society and the Philadelphia Department of Public Health. The committee will investigate in detail every death from pelvic cancer occurring in Philadelphia. An investigator will make a special study of that period of the patient's history from the onset of symptoms until adequate therapy has been instituted, the so-called "delay period." An attempt will be made in each case to explain the definite reason for any "delay" and to assign the responsibility to the patient, the doctor, the hospital or to all, as the case may be. The facts obtained from this study will be used as a means of educating the physicians of Philadelphia. The committee will meet each month to review the deaths of the previous month in an effort to decide from the facts where the blame for delay should be placed. The data for these cases will be obtained from the physicians in charge of the case, from the hospital charts and, when necessary, with the permission of the attending physician, from the relatives or the family of the patient. The data will be secured by a paid investigator of the committee who will personally call on the physicians, hospitals or others. As the work of this committee progresses and the monthly review of cases is carried on, the physicians in each case will be asked to take part in the discussion. Their presence at the discussion of their cases and the presence of other interested physicians at these open meetings will be a means of informing physicians of the work of the committee and of sensitizing them to the importance of keeping a "high index of suspicion" for pelvic cancer. According to an announcement, the committee is believed to be the first of its kind to be formed in this country. No previous attempt to "check up" on the physician and his handling of cancer cases has ever been done, it was stated. The committee is patterned after the Philadelphia Maternal Welfare Committee and hopes to accomplish for pelvic cancer what the maternal welfare committee has accomplished in reducing maternal mortality in Philadelphia. The committee, which has been organized to work with and for the physicians of Philadelphia, is financed by grants from the American Cancer Society and from the Philadelphia Obstetrical Society, which grants are barely sufficient to meet the present needs of the committee. Members of the newly formed committee are Drs. John Y. Howson, chairman; George A. Hahn, treasurer; Clayton T. Beecham, Leib J. Golub, Thaddeus L. Montgomery, Myer Solis-Cohen, Elizabeth S. Waugh and Philip F. Williams. In a statement the committee states that, generally speaking, one of the three factors is involved in any case where the "delay period" is prolonged: the physician, the patient, and the physician and the patient combined. The physician has been responsible for a prolonged "delay period" on the following counts: failure to make a diagnosis, wrong advice, wrong treatment, no treatment, failure to examine the patient adequately. The patient has been responsible because of fear of operation, fear of going to a doctor, fear of having cancer, economic reasons, and the like. The two factors are combined when both physician and patient are at fault. The committee believes that programs to educate the public have been worth while because of the increasing response of the public. Credit is ascribed also to various cancer detection clinics that have been established throughout the country. These, however, are believed not to have reached a majority of the people, indicating that the best approach still is through the practicing physician or family doctor.

SOUTH CAROLINA

Changes in Health Officers.—Dr. Edmond J. Bryson, Liberty, who has been serving as health officer for Oconee and Pickens counties, has been assigned health officer for Pickens County only and Dr. Furman T. Simpson, Westminster, will have charge of the Oconee Unit. The change was effective June 1.

Physicians Give 250 Years of Service to State.—At a meeting of the staff of the York County Hospital, Rock Hill, recently it was revealed that five physicians in attendance at the meeting had practiced medicine in South Carolina for a total of 250 years. The physicians and their years of service in the state are Dr. Joseph H. Saye, Sharon, 62 years; William A. Hood, Hickory Grove, 56 years; Charles B. Harrell, Rock Hill, 47 years; James R. DesPortes, Fort Mill, 45 years; James B. Elliott, Fort Mill, 40 years. The *Journal of the South Carolina Medical Association*, in an additional comment, claimed that this is a record unparalleled in any county of similar population, 58,000, in the United States.

WEST VIRGINIA

Changes in Health Officers.—At a special meeting of the Public Health Council in August the following city and county health officers were appointed: Drs. James E. Coleman (reappointed), Fayetteville, of Fayette County; Edgar H. Willard, Berkeley Springs, of Morgan County; Roscoe G. Stotts of Kenova, and James A. McClung of Richwood.

License Revoked.—The license of Dr. Ballard R. Gibson, Omar, has been revoked by the public health council on the grounds that credentials presented from the state of Tennessee for the procurement of licensure in West Virginia by reciprocity were fraudulent and that the certificate of premedical education at Pikeville (Kentucky) College was likewise fraudulent, according to the West Virginia State Medical Association. Dr. Gibson was formerly located at McAndrews, Ky.

ALASKA

Health Education Fellowship and Surveys.—The first fellowship in health education granted in Alaska has been awarded to Mrs. Kathleen Kimble, Alaska Native Service teacher at Point Hope. On completion of the course at the School of Public Health of the University of North Carolina, Chapel Hill, under the auspices of the National Foundation for Infantile Paralysis Mrs. Kimble will return to Alaska to become health education supervisor for the Alaska Native Service.——The division of maternal and child health and crippled children's services of the Alaska Department of Health, in cooperation with the medical profession, is conducting a survey throughout the territory to determine the prevalence of rheumatic fever in Alaska.——The department of health, the

department of education and the Alaska Native Service, in anticipation of establishing a division of rehabilitation in Alaska, is making a survey to ascertain the number of cases of deafness, blindness and speech defects in Alaska.

HAWAII

Personal.—Dr. Samuel D. Allison, for more than three years control officer of the division of venereal diseases in the board of health, Territory of Hawaii, has been given a temporary appointment of director of public health during the absence of Dr. Richard K. C. Lee, Honolulu, who has been given a year's leave for graduate study in New York.

Public Health Association Organized.—The Public Health Society of the Territory of Hawaii was recently organized. Officers include Kaarlo W. Nasi, P. A. sanitary engineer, U. S. Public Health Service, president; Theodore R. Rhea, C.P.H., director, Palama Settlement, vice president; Elmer J. Anderson, M.A., acting director of public health education, board of health, secretary, and Myrtle Payne, R.N., Castle and Cooke, Ltd., treasurer.

GENERAL

Special Society Election.—The following officers of the National Gastroenterological Association were recently reelected for a term of one year: Drs. Anthony Bassler, New York, president; Clarence J. Tidmarsh, Montreal, Canada, Harry M. Eberhard, Philadelphia, and William W. Lermann, Pittsburgh, vice presidents; Roy Upham, New York, secretary general; G. Randolph Manning New York, secretary, and Elihu Katz, New York, treasurer.

Survey of Needs for Day Care of Children.—The Child Welfare League of America has launched a nationwide survey for needs of day care of children, according to the New York *Times*. The work was started in anticipation of the emergency foreseen in the termination by October 31 of FWA of funds for children of working mothers. Howard W. Hopkirk, New York, executive director of the league, called for prompt and accurate reporting from 700 member agencies and affiliates in forty-three states "so that an up-to-date and correct picture of the situation may be presented to the President, who has power to continue such programs beyond November 1 if he finds proof that an emergency exists."

The Scudder Missionaries Return to Posts.—Two physicians of one family left for India on the *Gripsholm* August 28 to return as medical missionaries. They included Dr. Ida S. Scudder, who went to India in 1900 to serve forty-one years after being graduated at the Cornell University Medical College, New York, in 1899, and Dr. Lewis R. Scudder, physician in charge of a hospital at Kuwait, Arabia, Asia. According to the New York *Times* the Scudders are carrying out a family tradition started in 1819 by Dr. Ida S. Scudder's grandfather, also a physician. With Dr. Lewis Scudder were his wife and two children. Dr. Ida S. Scudder returned to the United States in 1941 but is going back to the All-India Christian Medical College as president emeritus to help develop a medical center there. Her niece, Dr. Ida B. S. Scudder, is professor of radiology and medicine at the All-India Christian Medical College, which was founded in 1918 at Vellore, India, and was formerly known as the Missionary Medical College for Women.

Changes in Status of Licensure.—The California State Board of Medical Examiners announces the following actions taken during its meeting in San Francisco, July 9-10:

Dr. John J. L. Doyle, Chico, license restored, July 9, and placed on five years' probation without narcotic privileges and with the proviso that he report to the board annually.

Dr. Milton S. McMurtry, license restored, July 9, and placed on five years' probation (no restrictions as to narcotics, as there was no narcotic charge originally involved). Dr. McMurtry must abide by all laws and report to the board annually.

Dr. Samuel J. Apfel, Brooklyn, license to practice in California revoked, July 10, because of revocation in another state.

Dr. James A. Hadley, Jamestown, placed on probation for a period of five years, without narcotic privileges and report annually to the board.

Dr. Benjamin F. Johnson, Jackson, Miss., California certificate revoked, July 10, because of revocation by another state.

Dr. Richard E. Orme, San Francisco, on July 10 placed on one year probation for violation of section 2392 of the Business and Professions Code, aiding an unlicensed practitioner. (No narcotic restrictions.)

The State Board of Medical Examiners of Georgia at a meeting, June 20, revoked the license to practice medicine of Drs. Grady L. Carter, Talbottom, and John Henry Moore Jr., Atlanta, and at a meeting, July 18, the license of Lucius H. Stinson, Augusta, was revoked. The Michigan State Board of Registration in Medicine at a meeting June 12, revoked the Michigan license to practice of Dr. David Friedman, Detroit, for unprofessional and dishonest conduct and of Dr. Carl W. Wagar, Kalamazoo, for unprofessional and dishonest conduct. In New Hampshire the license to practice of Dr. Richard Lewis Barker, Derry, was revoked on July 11 on grounds of personal habits that were such as to unfit him for the practice of medicine, according to the state board of registration in medicine.

Prevalence of Poliomyelitis.—Reports of cases of poliomyelitis for the week ended September 8 have been received from the division of public health methods, U. S. Public Health Service, as follows:

	Poliomyelitis Week Ended Sept. 8, 1945	Poliomyelitis Week Ended Sept. 9, 1944
New England		
Maine	10	0
New Hampshire	1	6
Vermont	8	2
Massachusetts	30	42
Rhode Island	1	1
Connecticut	9	13
M. Atlantic		
New York	114	581
New Jersey	60	50
Pennsylvania	62	130
E. N. Central		
Ohio	33	92
Indiana	28	23
Illinois	131	45
Michigan	11	75
Wisconsin	19	20
W. N. Central		
Minnesota	17	48
Iowa	9	25
Missouri	36	14
North Dakota	5	7
South Dakota	1	0
Nebraska	7	11
Kansas	13	7
S. Atlantic		
Delaware	3	12
Maryland	5	32
Dist. of Columbia	4	17
Virginia	30	67
West Virginia	9	24
North Carolina	11	26
South Carolina	6	4
Georgia	3	1
Florida	0	4
E. S. Central		
Kentucky	4	33
Tennessee	30	10
Alabama	4	5
Mississippi	1	9
W. S. Central		
Arkansas	5	0
Louisiana	7	5
Oklahoma	10	1
Texas	30	11
Mountain		
Montana	7	6
Idaho	1	0
Wyoming	2	0
Colorado	23	6
New Mexico	1	3
Arizona	1	0
Utah	23	0
Nevada	1	0
Pacific		
Washington	33	7
Oregon	7	11
California	30	12
Total	896	1,498
First 36 weeks:		
1945 and 1944	7,022	10,972
Median, 1940-1944	4,611	

The seasonal peak for 1945 was probably reached during the week ended August 25, when 931 cases were reported. This is peak on the basis of dates of reports; peak by onset of cases would probably be a week or ten days earlier.

American Ophthalmological Society.—The annual meeting of the American Ophthalmological Society will be held at the Homestead, Hot Springs, Va., November 12-14. Among the speakers will be:

Col. Derrick T. Vail Jr., M. C., An American Ophthalmologist in Europe.
Dr. Donald J. Lyle, Cincinnati, Laurence-Moon-Biedl Syndrome.
Dr. Burton Chance, Philadelphia, The Exposing and Fixing of the Eye in the Early Days of Cataract Extraction.
Dr. Eugene M. Blake, New Haven, Conn., Cultivation of Human Tumor Tissue in the Anterior Chamber of the Guinea Pig Eye.
Dr. Wendell L. Hughes, Hempstead, N. Y., Uses of Air in Ophthalmology.
Dr. M. Hayward Post, St. Louis, Dust Borne Infection in Ophthalmic Surgery.
Dr. Alfred Cowan, Philadelphia, Concerning Ocular Imagery.
Dr. Daniel B. Kirby, New York, Paralysis of Ocular Elevation With and Without Blepharoptosis.
Dr. Arthur J. Bedell, Albany, N. Y., Retinal Vessel Proliferation in Diabetes.
Drs. Algernon B. Reese and Frank Payne, New York, So-Called Persistent Tunica Vasculosa Lentis or Retrolental Fibroplasia of Terry.
Dr. Albert D. Ruedemann, Cleveland, Full Plastic Eye Implant.
Dr. Philip M. Lewis, Memphis, Tenn., Penicillin in Gonococcic Conjunctivitis. Its Use in (About) 25 Cases Compared with the Sulfonamides in 173 Cases.
Dr. William H. Crisp, Denver, A Device for Group Demonstration of Astigmatism Tests.
Dr. Glen G. Gibson, Philadelphia, Marginal Myotomy: An Analysis of Twenty-Two Operations.
Drs. Everett L. Goar and Charles R. Potts, Houston, Texas, The Relationship of Rubella in the Mother to Congenital Cataracts in the Child.
Dr. Trygve Gundersen, Brookline, Mass., Vosseus Ring in Ten Battle Casualties.
Drs. Conrad Berens and Hunter H. Romaine, New York, Choice of Sutures in Surgery of the Ocular Muscles.
Dr. Bernard Samuels, New York, Cataract Complicating Intraocular Tumors.
Dr. Maynard C. Wheeler, New York, Exophthalmos Caused by Eosinophilic Granuloma of Bone.
Dr. F. L. Philip Koch, New York, Intraocular Manifestations of Disseminated Lupus Erythematosus.
Dr. Francis Heed Adler, Philadelphia, Physiologic Factors in the Diagnosis of Superior Oblique and Superior Rectus Palsy.
Dr. Ramon Castroviejo, New York, Indications and Contraindications for Keratoplasty and Keratectomy.
Dr. Leslie C. Drews, St. Louis, An Accurate Method for Centering a Front Stop During Cycloplegic Refraction.
Dr. Walter S. Atkinson, Watertown, N. Y., Preliminary Report on Corneal Section with Long Bevel with Conjunctival Flap for Cataract Extraction.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Aug. 25, 1945.

The Sterilization, Care and Use of Syringes

Mild inflammations and infections not uncommonly follow the inoculation and injections which play so important a part in modern treatment. More severe and even fatal results sometimes occur and usually can be traced to some technical fault. These include cellulitis, lymphadenitis, abscesses, tuberculosis, tetanus, gas gangrene, infective hepatitis, malaria and meningitis (due to contaminated lumbar puncture needles). The Medical Research Council therefore appointed a committee of leading pathologists, under the chairmanship of Prof. G. S. Wilson, to report on the sterilization, use and care of syringes. The committee presented a memorandum, based on the experience of many workers and on bacteriologic tests, leading to recommendations which have been proved to be safe and practicable.

It states that complete bacteriologic sterility can be achieved only by use of the autoclave or hot air oven. Boiling in water will destroy all pathogenic bacteria except those that produce resistant spores. Chemical disinfectants, if they kill spores at all, do so slowly and cannot always be relied on to destroy even nonsporing bacteria in syringes. A fresh sterile syringe and needle must be used for each injection or aspiration. In clinics where many injections of the same fluid are given, the same syringe may be used for several subcutaneous or intramuscular—but not intravenous—injections, provided a fresh needle is used for each patient. A syringe that has been used for aspiration, e. g. of blood from a vein or of pus from an abscess or for intravenous injection, which always entails aspiration of blood, must be cleaned and sterilized before it is used again. It is essential to keep syringes for injection separate from those used for aspiration. Syringes and needles require thorough cleaning after use, before resterilization. Sterilization methods may be unreliable if the syringe or needle contains dirt or coagulable protein. Contamination of syringes and needles may occur during assembly after sterilization as the result of contact with fingers, dust or droplets of saliva from either the doctor or the subject, or of contact of the needle with a nonsterile surface. Needles should be handled only with sterile forceps, syringes with dry washed hands, care being taken to touch only the outside of the barrel and the handle of the piston. The handler should not talk, cough or sneeze over a sterile syringe. Persons with known or suspected upper respiratory infections must wear masks while carrying out injections. The practice of "dishing up" a sterile syringe and needle in an open bowl, especially one which contains any liquid, is condemned. Sterile syringes and needles must be placed in sterile covered containers. Use of a pocket handkerchief must at once be followed by thorough hand washing.

A National Maternity Service

Representatives of the British Medical Association have met representatives of the Royal College of Obstetricians and Gynecologists on the question of a national maternity service and particularly on the role of the general practitioner. A provisional agreement has been reached on the following points: 1. After qualification a practitioner needs adequate and regular experience in obstetrics. 2. Midwifery standards should be raised by (*a*) inclusion of a resident midwifery post in the preregistration hospital posts proposed in the Goodenough report on medical education, (*b*) creating an increased number of resident obstetric posts available to recently registered practitioners, (*c*) organization of the proposed comprehensive medical service so as to secure for each pregnant woman a general practitioner, a midwife and, where necessary, an obstetric specialist, (*d*) recognition for the purposes of the future service of those general practitioners who desire to undertake obstetrics, provided they undertake sufficient to enable them to remain efficient.

The Title of "Nurse" to Be Restricted by Law

After October 15 the title of nurse can no longer be assumed by any one who wishes to do so. The minister of health has made it an offense to use the title unless the person doing so is a state registered or enrolled assistant nurse. Agencies supplying nurses must be licensed by the local authorities and must supply only those who are state registered, enrolled assistant nurses, midwives or members of other classes to be prescribed. There is to be an exception for children's nurses, who may use the term unless circumstances suggest that they are something other than children's nurses. Other permitted uses are "trained nurse" by those on the general part of the nurses list, "maternity nurse" by midwives and "student nurse" and "pupil assistant nurse" by those training for state registration and for the Assistant Nurses Roll. The object of these orders is to protect the public against the use of the term "nurse" by persons having no nursing qualification and against the risk of being supplied without their knowledge with the services of unqualified persons. Regulations also prescribe the form in which licenses for agencies are to be made and the form in which agencies must notify the nurse's qualification to the person employing her.

PARIS

(From Our Regular Correspondent)

July 28, 1945.

Disturbances of Pulmonary Ventilation

At the Robert Debré Clinic for Diseases of Children, Debré and his collaborators stress the frequency and variety of conditions capable of provoking disturbances of the pulmonary circulation and the polymorphism of these disorders. A foreign body, for example, can hinder the entry of air in a limited pulmonary area and thus create atelectasis; it can also cause a localized emphysema by a valve action, as shown by Chevalier Jackson. The mechanical obstruction may be accompanied by more or less severe reflex phenomena. An attack of asthma, which is also a reflex disturbance, can by itself cause grave modifications in the respiratory mechanism, which will further complicate the consequences of intrabronchial glandular hypersecretion. Many other causes injure in the same way either mechanically or by reflex action the pulmonary ventilation.

The difference between pulmonary collapse and atelectasis is that the collapse produces only incomplete pulmonary compression, in which the pulmonary permeability is still preserved. There remains some functional action of the lung. In atelectasis the pulmonary collapse is complete and the compressed tissues are functionally eliminated; they are shriveled, somewhat hyperemic and appear on the screen as an almost complete opacity.

These phenomena are evanescent and changeable. They require repeated roentgenologic examination. They present special pathologic aspects. Debré and his collaborators designate them as "pneumonoses" in contradistinction to the infectious pneumopathies or "pneumonitis." In older children the pneumonoses are generally associated with tuberculosis of the mediastinal lymph nodes, with a pneumonia, with the inhalation of a foreign body or with a bronchial tumor. In infants the appearance is often sudden and spontaneous and the diagnosis is often made only by roentgenoscopy. The evolution can be rapid; the young child may succumb with symptoms of paroxysmal dyspnea, cyanosis and collapse. At other times the disorder terminates without having noticeably disturbed the health of the child. The etiology of these accidents is often uncertain. Their course, as well as their clinical and roentgenologic signs,

presents disconcerting variations. Asthma and whooping cough may be considered as belonging to the same nosographic family; with their peculiar roentgenographic picture they closely resemble emphysema.

The pneumonoses and the pneumonotic syndromes must be differentiated from pneumonitis just as the nephroses must be differentiated from the nephritides. "It is necessary to avoid the widespread tendency to attribute to an infectious process disturbances which in reality are associated with mechanical phenomena."

In the course of lectures given on this subject at the Clinic of Children's Diseases, the associates of Professor Debré have presented chapters on this new aspect of pulmonary disease. The tracheobronchial adenopathy, which was once considered important and was later disregarded, was assigned once more its role in the disturbances of the pulmonary circulation. These disturbances depend on bronchial compression by caseous adenitis; they lead sometimes to atelectasis and more rarely to localized emphysema. They are not characteristic and are not accompanied by pathognomonic physical signs. The diagnosis is made principally on the basis of the evolution of roentgenographic or tomographic records. Bronchoscopy also is helpful.

These ideas concerning the frequent existence of unrecognized atelectases or emphysemas in children have considerable importance. Besides their theoretical interest and their value for the knowledge of the normal and pathologic physiology of the pulmonary function they avoid the confounding with tuberculous cavities of transparent bubbles seen on the screen; they guard against erroneous induction of pneumothorax in parenchymatous lesions, when the presence of Koch bacilli cannot be demonstrated; they also influence the prognosis in pulmonary disorders of infants and young children, in whom the roentgenograms show cavitations.

BRAZIL

(From Our Regular Correspondent)

RIO DE JANEIRO, Aug. 31, 1945.

Epidemic of Influenza

During the second half of July the number of cases of influenza began to mount sharply in Rio de Janeiro. Since July is midwinter in the Southern Hemisphere, it is the normal time for the high point in the curve of prevalence of influenza. As the reporting of cases of transmissible diseases is not well developed here, particularly in the case of common colds and influenza, the only foundation for the study of the incidence of the disease is the mortality. The annual death rate from influenza, computed only on the basis of the death certificates clearly stating that influenza was the cause of the death, varies normally, in Rio de Janeiro, between 35 and 55 per hundred thousand of population, reaching peaks of 65, 70 and even 80 per hundred thousand at intervals of two to four years. The health department made efforts to get more reports of cases, but a better picture of the outbreak has been obtained through the study of the absenteeism in schools, offices and factories. A sample of about 40,000 industrial and clerical workers of all the districts of the city has shown that the rate of absenteeism in the offices and factories included in the sample rose from the normal of about 3 to 4 per cent to 7.97, 8.64, 7.09 and 8.32 respectively in the first four days of August (average percentage of 8.01 for the four days which corresponded to the peak of the curve of absenteeism), then slowly began to decline. At the end of August the percentage of absences was still at the relatively abnormal level of more than 5. A similar, but larger, sample (about 80,000 individuals) formed with children of the primary and high schools has shown the same condition, the only difference being that the highest percentage of absentees was registered about the 7th or 8th of August. The death rate from influenza averaged 51 per hundred thousand during the months of June and July; it began to rise in the last week of July (99 per hundred thousand) and then continued, rapidly reaching 165 and 187 per hundred thousand, respectively, in the first and second weeks of the month, which corresponded to the peak of mortality.

Hospital News

A small but modern hospital has been opened at Barra do Garças, state of Goyaz. The event is particularly noteworthy because the hospital is located in a backward section of the country, where the federal government is spending important sums of money, through the organization known as the Central Brazil Foundation, in a program to improve the general condition of the people.

The city of Rio de Janeiro has recently acquired a plot of land to increase the area of the Fernando Magalhães Maternity Hospital, which bears the name of the late professor of obstetrics of the university of this city, who was one of the leading practitioners of the specialty. This will permit the enlargement of the maternity, which serves a densely populated section of the suburbs of the city. The hospital has at present 50 beds.

The city of São Paulo has acquired a plot of land of 3,288 square meters (3,611 square yards) and transferred it to the São Paulo Association to Combat Cancer, which immediately will begin the construction of a cancer hospital.

The Division of Hospital Organization of the National Department of Health has published a booklet under the title History and Evolution of Hospitals, which is the first of a series to be distributed free, as a contribution to improve the hospital situation in Brazil. The booklet has been written by Dr. Ernesto de Souza Campos, professor at the São Paulo University, who is considered in Brazil an authority on the subject of hospitals. Dr. Campos stayed for several years in the United States and has also visited several hospitals in Great Britain, France and Germany.

A modern and well equipped tuberculosis hospital with 350 beds will be dedicated on August 4 in the borough of Fonseca of the city of Niteroi (population 150,000), capital of the state of Rio de Janeiro, close to the Federal District (city of Rio de Janeiro). The institution will be known as the Azevedo Lima Hospital, to honor a great phthisiologist native of the state of Rio de Janeiro. There are at present in Niteroi an average of 320 annual deaths from tuberculosis per hundred thousand of population.

Death of Paulo Cesar de Andrade

Dr. Paulo Cesar de Andrade, one of the most famous surgeons of Brazil and the leader of surgery in Rio de Janeiro, died a few days ago at the age of 51, the victim of a car accident. Dr. Andrade was also the medical superintendent of the Misericordia Hospital and director of a center of postgraduate teaching at the hospital, the foundation of which was reported in THE JOURNAL, January 27, page 240.

Marriages

DAVID WENTWORTH BARTON, Troy, N. Y., to Miss Lilias Howland Swift of Princeton, N. J., July 14.

HENRY A. RUSCH JR., Centre Island, N. Y., to Miss Frances May Williams of Westfield, N. J., July 27.

MATTHEW A. STROUP, Cherryville, N. C., to DR. FRANCES P. SHAW of Oxford, Miss., June 11.

JOHN TRENTON TUCKER JR., Fort Worth, Texas, to Miss Dorothy Dee Hill of Dallas, June 2.

MARVIN DALE SMITH, Clinton, Miss., to Miss Mary Eleanor Gower of Grifton, N. C., July 8.

NINO A. BOLOGNA, Shaw, Miss., to Miss Betty Rowlett of Sweetwater, Texas, July 25.

JACK LEE FOSTER, St. Louis, to Miss Charlotte Smith of Cairo, Ill., June 30.

Deaths

Thomas Darlington, New York; College of Physicians and Surgeons, New York, 1880; born in Brooklyn Sept. 24, 1858; member of the American Medical Association, American Clinical and Climatological Association, New York Academy of Medicine, Society of Medical Jurisprudence, Harvey Society and the Physicians Mutual Aid Association; retired member of the Medical Society of the State of New York; fellow of the American Association for the Advancement of Science and the New York Academy of Science; served as vice president of the Greater New York Medical Association, National Institute of Social Science and the American Association for Promoting Hygiene and Public Baths; for three years surgeon to the Copper Queen Consolidated Mining Company and the Arizona and Southwestern Railroad Company with headquarters in Bisbee, Ariz.; served on the school board of the Bronx, on the visiting staff of St. John's Hospital in Yonkers, New York Foundling, French Seton and Fordham hospitals; medical editor of the New York *Mail and Express* from 1891 to 1893; health commissioner and president of the board of the city of New York from 1904 to 1910; in 1930 made commissioner emeritus; member of the New York State Workmen's Compensation Commission, 1914-1915; trustee and first vice president of the Metropolitan Savings Bank; director of the Morris Plan Bank; one of the fourteen executive members of the Congress of Physicians and Surgeons from 1907 to 1939; major, medical corps, U. S. Army, during World War I; served as professor of anatomy, principles of surgery, pathology and hygiene at the New York College of Dentistry, of which he had been a trustee, director and treasurer; formerly lecturer on industrial hygiene at the Stevens Institute of Technology and Fordham University, and sanitary engineer for the city department of health; for two years chairman of the Democratic County Committee; in 1924 received the honorary degree of doctor of literature from Juniata (Pa.) College; died at his summer camp, Burnt Hope, about 16 miles from Port Jervis, August 23, aged 86.

Sylvester Jacob Goodman ✠ Columbus, Ohio; Jefferson Medical College, Philadelphia, 1900; born in Uhrichsville, Ohio, Oct. 28, 1876; also a pharmacist; specialist certified by the American Board of Obstetrics and Gynecology, Inc.; in 1928 served as president of the Columbus Academy of Medicine; formerly councilor of the Tenth District of the Ohio State Medical Association, serving it as secretary from 1924 to 1934; president of the Columbus Obstetric Society; one of the founders of the Columbus Medical Bureau and a member of its original board of trustees; honorary fellow of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons; fellow of the American College of Surgeons; formerly on the faculty of the Starling Medical College; served overseas during World War I; on the staffs of the White Cross Hospital, Institution for the Feebleminded and St. Ann's Maternity Hospital; member of the surgical staff and director, obstetric department, Grant Hospital, where he died July 5, aged 68, of coronary thrombosis.

Alexander Hamilton Stewart ✠ Harrisburg, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1907; born in Plumville, Pa., July 22, 1880; in 1939 appointed deputy secretary of health and in 1941 acting secretary and in 1942 secretary of the Pennsylvania Department of Health; chairman of the advisory health board of the state of Pennsylvania; member of the House of Delegates of the American Medical Association in 1942, 1943 and 1944; served for ten years as secretary of the Indiana County Medical Society, of which he had been president for two terms of five years each and as trustee and councilor representing the Ninth District of the Medical Society of the State of Pennsylvania; at one time coroner and medical director of Indiana County; fellow of the American College of Physicians; from 1937 to 1940 chairman of the Indiana County Republican Committee; served as physician for the Pennsylvania Railroad and the Baltimore and Ohio Railroad; died July 31, aged 65, of acute myocardial infarction.

David Carl Farnsworth, San Fernando, Calif.; University of Southern California College of Medicine, Los Angeles, 1906; born June 5, 1882; served in France during World War I; entered the U. S. Public Health Service Reserve in 1920 as a surgeon; served as general inspector the following year with headquarters in Denver and San Antonio and clinical director of the Veterans Administration Facility in Houston; later assistant medical officer in charge of the Veterans Administration Facility in Legion, Texas, and chief of the tuberculosis division, Central Office, Washington, D. C.; at the time of his death manager of the Veterans Administration Facility in San Fernando; died July 21, aged 63, of coronary thrombosis.

William J. Seymour ✠ Detroit; Detroit College of Medicine, 1903; born in Detroit Sept. 30, 1878; served on the faculty of his alma mater; fellow of the American College of Surgeons; for twelve years a member of the welfare commission; for many years on the staffs of the Receiving, Providence and St. Mary's hospitals; many years ago organized the medical and surgical services at the Eloise Hospital in Eloise, Mich.; the William J. Seymour Hospital in Eloise was named for him; in charge of Michigan's first public cancer clinic in Detroit in 1932; received the honorary degree of doctor of laws from the University of Detroit in 1933; died August 4, aged 66, of coronary thrombosis.

Jay Weir Grissinger ✠ Colonel, U. S. Army, retired, Harrisburg, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1898; Army Medical School in 1903 and the Army War College in 1920; born Aug. 22, 1875; entered the army as an assistant surgeon in 1902; promoted through the various grades to that of colonel on June 24, 1928; surgeon for the second corps area; held the Distinguished Service Medal; retired August 31, 1939; served during World War I; fellow of the American College of Surgeons; died in the Walter Reed General Hospital, Washington, D. C., August 8, aged 69, of hypertensive cardiovascular disease and cerebral infarction.

John Alexander Steward ✠ Chattanooga, Tenn.; University of Pennsylvania School of Medicine, Philadelphia, 1926; born in Chattanooga, Tenn., Aug. 6, 1897; fellow of the American College of Surgeons; interned at the Robert Packer Hospital in Sayre, Pa.; fellow in surgery at the Mayo Foundation in Rochester, Minn., from 1927 to 1932; served as chief of staff of the Pine Breeze Sanatorium and the Erlanger Hospital; served overseas during World War I; a major in the medical corps, Army of the United States, from September 1942 to December 1944, when he retired because of ill health; died in St. Mary's Hospital, Tucson, Ariz., July 7, aged 47, of cardiac failure.

Walter Black Rogers ✠ Cleveland; Johns Hopkins University School of Medicine, Baltimore, 1910; born in Waynesburg, Pa., in 1883; assistant clinical professor of surgery at the Western Reserve University School of Medicine; served in France with the Lakeside Unit during World War I; lieutenant colonel, medical reserve corps, U. S. Army, not on active duty; member of the Cleveland Medical Library Association; for many years on the staff of the Lakeside Hospital; died in the Leonard C. Hanna House-University Hospitals, July 12, aged 61, of embolism in pulmonary cavity following an operation.

Lawrence C. Ingram, Orlando, Fla.; Keokuk Medical College, College of Physicians and Surgeons, 1903; born in Perry Ill., in 1872; member of the American Medical Association and in 1932 of the House of Delegates; member of the Southeastern Surgical Congress and the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; specialist certified by the American Board of Otolaryngology; past president of the Wabasha County Medical Society; on the staff of the Orange General Hospital; died in a hospital at Lake City, Minn., July 2, aged 72, of Hodgkin's disease.

Mary Caroline Abney-Squillace, Richland, Wash.; Washington University School of Medicine, St. Louis, 1935; interned at Hospital of the Woman's Medical College of Pennsylvania in Philadelphia and the Bellevue Hospital in New York; served a residency at the Brandywine Sanatorium in Marshallton, Del.; at one time joined the staff of Barnes Hospital in St. Louis as administrative assistant to the superintendent; died May 20, aged 33.

Herman R. Biersdorf, Portland, Ore.; University of Oregon Medical School, Portland, 1896; member of the American Medical Association; life member of the Oregon State Medical Society; died June 1, aged 72, of coronary occlusion.

Herman A. H. Bouman ✠ Minneapolis; University of Minnesota College of Medicine and Surgery, Minneapolis, 1897; at one time on the faculty of his alma mater; fellow of the American College of Surgeons; chairman of the board of directors of St. Andrew's Hospital and an honorary member of the staff of Northwestern Hospital; died June 18, aged 75, of coronary occlusion.

Isidor Eckert, New York; Baltimore Medical College, 1908; died April 6, aged 58.

Samuel Jesse Goldfarb ✠ New York; Columbia University College of Physicians and Surgeons, New York, 1905; for many years on the staff of the Mount Sinai Hospital; died June 27, aged 64.

Charlotte E. Goodman, Mount Pleasant, Pa.; Woman's Medical College of Pennsylvania, Philadelphia, 1893; for many years associated with the State Hospital in Harrisburg; in 1943 awarded a citation by her alma mater for being a fifty year graduate; died June 12, aged 84, of exhaustion due to arteriosclerosis and valvular heart disease.

Edward Andrew Grice, Epps, La.; Memphis (Tenn.) Hospital Medical College, 1908; member of the parish school board and health unit; died June 20, aged 61.

Joseph Lowery Johnson, Columbus, Ohio; Howard University College of Medicine, Washington, D. C., 1902; formerly minister to Liberia, representing that country at the Versailles Peace Conference; past president of the board of trustees of Wilberforce University; at one time special investigator for the United States Pension Bureau; died July 18, aged 72.

Patrick Eugene Keeffe, Sioux City, Iowa; Jefferson Medical College of Philadelphia, 1910; member of the American Medical Association; died in Ann Arbor, Mich., June 8, aged 59.

Irene Amanda Tognazzini Kenny, Jersey City, N. J.; Stanford University School of Medicine, San Francisco, 1916; in charge of clinics and director of the outpatient department of the Jersey City Medical Center, where she died April 25, aged 58, of coronary thrombosis following a cholecystectomy.

Louis Albert Kirshner, Philadelphia; Medico-Chirurgical College of Philadelphia, 1909; member of the American Medical Association; associated with Mount Sinai Hospital; died June 17, aged 60.

Thomas Leonard Lamkin, Clinton, Ky.; Barnes Medical College, St. Louis, 1899; member of the American Medical Association; also a lawyer; for eight years county attorney; died May 26, aged 72.

James Everard Massey ✠ Rock Hill, S. C.; Medical College of the State of South Carolina, Charleston, 1899; formerly state senator; honorary member of the South Carolina Medical Association; served as a member of the city board of health and of the teaching staff of the York County Hospital, where he died July 14, aged 70, of heart disease.

William Lester Mathews, Winder, Ga.; Atlanta College of Physicians and Surgeons, 1913; member of the American Medical Association; served overseas during World War I; served as physician in charge of the Barrow County Health Department; a member of the county board of education; the Mathews School was named for him; an examiner for the Selective Service Board; surgeon for the Seaboard Railway; served as president of the Alumni Association of Emory University School of Medicine; died May 4, aged 58.

William Fredrich Mayer-Hermann, New York; Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, Germany, 1914; member of the American Medical Association; died in the Sydenham Hospital June 13, aged 54.

Olin Kingsley McGarrah, Altoona, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1895; died June 6, aged 74.

HARRY M. LEVIN, Surgeon, U. S. P. H. S. (R) 1903-1945

Paul Scott Miller, Grand Rapids, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1905; chief of staff of D. A. Blodgett Home for Children for many years; died in the Blodgett Memorial Hospital June 13, aged 64.

Samuel Nempzoff, Philadelphia; Temple University School of Medicine, Philadelphia, 1935; on the staff of the Northern Liberties Hospital; died June 30, aged 34.

Ralph Henry Newcomb, Upper Lake, Calif.; University of Southern California College of Medicine, Los Angeles, 1908; died in June, aged 61.

Clarence S. Ordway ✠ Toledo, Ohio; Baltimore Medical College, 1902; founder and managing director of the East Side Hospital; died April 27, aged 71.

John David Rudisill ✠ Lenoir, N. C.; University of Maryland School of Medicine, Baltimore, 1922; fellow of the American College of Surgeons; served during World War I; examining physician for the county draft board during World War II; recently appointed as a member of the North Carolina Board of Conservation and Development; physician in charge of the Caldwell Hospital; surgeon, Watauga Hospital, Boone, and the Blowing Rock Hospital, Blowing Rock; surgeon to the Southern Railway; died in Edgemont July 28, aged 51.

Samuel D. G. Scruggs, Memphis, Tenn.; Kentucky School of Medicine, Louisville, 1886; died June 27, aged 95.

John Albro Sipher, Norwalk, Ohio; Western Reserve University Medical Department, Cleveland, 1903; member of the American Medical Association; past president of the Huron County Medical Society; served during World War I; lieutenant colonel, medical reserve corps, U. S. Army, not on active duty; for many years served on the school board; died June 4, aged 71.

Charles Burr Sitgreaves, Pemberton, N. J.; Baltimore Medical College, 1902; died May 24, aged 73, of lymphatic leukemia and diabetes mellitus.

George Edward Owen Leo Smith, Hoosick Falls, N. Y.; Albany Medical College, 1918; member of the American Medical Association; village health officer and school physician; served during World War I; died June 18, aged 50, of coronary occlusion.

Asa Bertrand Starbuck, Dallas, Ore.; University of Oregon Medical School, Portland, 1906; chairman of the Polk County chapter of the American Red Cross; member of the school board and city council; county health officer; on the staff of the Dallas Hospital; died June 8, aged 69, of coronary heart disease.

Albert Mason Stevens, Kaneohe, Hawaii; Columbia University College of Physicians and Surgeons, New York, 1915; served during World War I; died August 6, aged 61.

Eusebius J. Summers, Belva, W. Va.; College of Physicians and Surgeons, Baltimore, 1908; formerly a lawyer; died May 21, aged 72.

Clarence Irouth Thomas ✠ Guthrie Center, Iowa; State University of Iowa College of Medicine, Iowa City, 1905; died May 28, aged 63, of coronary thrombosis.

Alonzo Clinton Ward, Osceola, Mo.; Kentucky School of Medicine, Louisville, 1884; died May 28, aged 89, of cerebral hemorrhage.

PUBLIC HEALTH SERVICE

Harry M. Levin, Surgeon, U. S. Public Health Service Reserve, Malden, Mass.; born in Baltimore, Sept. 7, 1903; College of Physicians and Surgeons, Boston, 1933; interned, Christ Hospital, Jersey City, N. J., and Prospect Heights Hospital in Brooklyn; served as medical consultant and sanitary supervisor to firms in Malden; member of the American Medical Association; commissioned in the Public Health Service Reserve in February 1943; first assigned to stations on the West Coast and since September 1944 had been on sea duty in the South Pacific with the U. S. Coast Guard; shortly before his death was promoted to the rank of surgeon; medical officer on the U. S. S. *Serpens,* which was destroyed by enemy action in January at Guadalcanal; aged **41;** reported missing January 29; declared killed in action by the Navy Department.

Miscellany

ADDRESS BY SAMUEL GOMPERS, PRESIDENT AMERICAN FEDERATION OF LABOR[1]

Delivered in Washington, D. C., Dec. 5, 1916

One great, harmonious chord has been sounded since the opening of this meeting, and under such circumstances it is not a pleasant duty to sound a discord. Yet such a part I have frequently felt myself called upon to play.

For more than half a century out of my sixty-six years of life I have been concerned in the effort to try to bring light and a greater degree of happiness into the lives and the work of my fellow men, and particularly of my fellow workers. I doubt if there be any one whose life is more attuned to the misery and the suffering of any one of my fellows than mine. With me it is the thought not only of helping to assuage immediate want or suffering but of maintaining the opportunities of men to struggle for right and for justice.

There has never yet come down from any government any substantial improvement in the conditions of the masses of the people, unless it found its own initiative in the mind, the heart and the courage of the people. Take from the people of our country the source of initiative and the opportunity to aspire and to struggle in order that that aspiration may become a reality, and, though you couch your action in any sympathetic terms, it will fail of its purpose and be the undoing of the vital forces that go to make up a virile people. Look over all the world where you will and see those governments where the features of compulsory benevolence have been established, and you will find the initiative taken from the hearts of the people.

There are certain species of compulsory social insurance that by their mere statement carry with them the conviction of their self-evident necessity and justice, into which the element of depriving the people of rights cannot enter—such as workmen's compensation and old age pensions. But when compulsory health insurance and compulsory unemployment insurance are proposed, the question arises at once, What are the conditions and regulations to be imposed by the government to regulate the conduct of the supposed beneficiaries?

By reason of the many duties devolving on me I have not had the opportunity to prepare a paper. I have made some memoranda, and I ask your indulgence to present thoughts which press upon me in the best way I can within the limit of time set for these proceedings.

The highest standards in the lives of the workers have been secured by the development, the organization and the exercise of the economic power of the workers. Although this economic power is superficially indirect, it is in reality the most potent and the most direct social insurance of the workers. It is the only agency that can readily guarantee to the workers protection against the results of the eventualities of life and give them a feeling of security.

There is more voluntary social insurance among the workers in the United States than in any other country in the world.

The organization of labor, which has secured reductions in the hours of their daily toil, which has secured higher wages and better standards of life, which has secured safety and sanitation, has done more to eliminate poverty and misery and unemployment and sickness than all other agencies of government and private individuals combined.

The trade-union of which I am a member and to which I owe my primary membership, in less than twenty-five years, as shown by absolutely accurate data, has reduced the sickness of its membership to a marked degree. It has lengthened the lives of the members of that craft on an average more than sixteen years. What is true of that organization is true to a greater or less degree of every other trade-union in America.

The organizations of labor provide social insurance in cases of sickness or unemployment far too little to be true to their mission, far too narrow to suit my impatient spirit; but the willingness to fly from the ills we bear to those of which we know not is quite too general among men who are well meaning, yet who are theorists, or who desire to indulge themselves in a fad that involves grave consequences not only to the workers themselves but to the fundamental principles of freedom.

Social insurance cannot even undertake to remove or prevent poverty. It is not fundamental and does not get at the causes of social injustice. The only agency that does get at the cause of poverty is the organized labor movement.

Social insurance, in its various phases of sickness insurance, unemployment insurance and death benefits, provides the means for tiding over an emergency.

The labor movement aims at constructive results—higher wages, which mean better living for the worker and those dependent upon him, better homes, better clothes, better food; and shorter hours of work, which means relief from overfatigue and time for recuperation, workers with better physical development and with sustained producing power. Better physical development is in itself an insurance against illness and a certain degree of unemployment. The short hour workmen, with higher wages, become better citizens, better able to take care of themselves.

Then again, the first step in establishing compulsory social insurance is to divide people into groups, those eligible for benefits and those considered capable of caring for themselves. The division is based on earning capacity. This governmental regulation must tend to fix the citizens of the country into classes, and a long-established insurance system would tend to make those classes rigid.

Governmental power grows upon that on which it feeds. Give an agency power, and it at once tries to reach out after more. Its effectiveness depends on increasing power. This has been demonstrated by the experience of the railroad workers in the recent enactment of the Adamson law. When Congress exercised the right to establish eight hours for railroad men, it also considered a complete program for regulating railroad workers, which culminated in the effort to take from them the right to quit work, and conscription providing for compulsory service.

Recently a gentleman of the highest standing stated to me that during the time he was in Germany, and in a position to know, German workmen came to him seeking aid to get out of that country to the United States. They told him that by reason of the taxes which they were compelled to pay into compulsory social insurance schemes, they had no money left except for absolute necessities of life and were unable to secure sufficient funds to come to the United States even in the steerage. He said to me further that in Germany, where compulsory social insurance has been more extensively worked out than in any other country, the workmen of that country, by reason of their property interests in compulsory social insurance, have been compelled to remain in Germany and work under circumstances, wages, hours and conditions of employment which forced them to endure conditions below standards of a living wage.

Is it not discernible that the payments required of workmen for this compulsory social insurance interfere very materially with mobility of labor and constitute a very effectual barrier to the workers' determining their whole lives?

It seems to me that what we in America will have to do is to proceed on grounds that shall bring not only social insurance of a practically advantageous character but that shall help

1. Published in the Bulletin of the U. S. Bureau of Statistics, No. 212, page 845.

to develop individuality and personality and character and help to recognize the real struggle of the masses of the people, to encourage them in their struggle so that they may have the higher and the better opportunity for self development. What we should aim to do is to encourage voluntary associated effort of free individuals for their social insurance.

Industrial freedom exists only when and where wage earners have complete control over their labor power. To delegate control over their labor power to an outside agency takes away from the economic power of those wage earners and creates another agency for power. Whoever has control of this new agency acquires some degree of control over the worker. There is nothing to guarantee control over that agency to employees. It may also be controlled by employers. In other words, giving the government control over industrial relations creates a fulcrum which means great power for an unknown user.

The introduction of compulsory social insurance in cases of sickness, or compulsory social insurance in cases of unemployment, means that the workers must be subject to examinations, investigations, regulations and limitations. Their activities must be regulated in accordance with the standards set by governmental agencies. To that we shall not stand idly by and give our assent.

At this moment the peoples of the European countries engaged in this titanic, brutal struggle are organized, and they exhibit a virility and a ferocity unknown in the history of the world. The intensity of their labor, the intensity of their activity, is not a good standard by which anything now can be judged; but in our industrial, commerical, political and social fabric, the fabric of the United States, there has never been a people in the history of the world so virile in intellectuality, in industry, in intensity, as were and are our own, much misrepresented even though they be.

Men and women, I trust I may not be sounding my warnings on the empty air. I hope that they may find a lodgment in the minds and the hearts of my countrymen. I bid you have a care in all these attempts to regulate the personal relations and the normal personal activities of the citizenship of our country ere it be too late.

There is in the minds of many an absence of understanding of the fundamental essentials of freedom. They talk freedom and yet would have bound upon their wrists the gyves that would tie them to everlasting bondage. And no matter how sympathetic or humanitarian is the gloss over the plan and the scheme, I again bid you beware. We know not when or how this great struggle going on in Europe will terminate, or what it shall mean for the future of those countries; but at least let the people of the United States hold their liberties in their own hands, for it may come to pass that our America, the America whose institutions and ideals we so much revere, may be the one nation to hold the beacon light of freedom aloft and thus aid in relighting the torch, rekindling the heart flame of the world's liberty.

Last Saturday night I witnessed a sight in the harbor of New York City that thrilled me anew in the hope of the perpetuity of the principles on which our republic is based. I saw there the Statute of Liberty, and at the pressing of a button by the President of the United States the whole structure of that wonderful image was illumined and bathed with a light that could not but inspire the meanest of all. In the hand of the Statue of Liberty was a new construction, so that the flame in that torch might be visible to all who might see.

My hope is that we shall be enabled to sing, as we hope that the generations who follow us shall be enabled to sing—

> My country, 'tis of thee,
> Sweet land of liberty.

For a mess of pottage, under the pretense of compulsory social insurance, let us not voluntarily surrender the fundamental principles of liberty and freedom, the hope of the Republic of the United States, the leader and teacher to the world of the significance of this great anthem chorus of humanity—liberty!

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, Sept. 15, page 232.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Mar. 19-21. Sec. Dr. B. F. Austin, 519 Dexter Ave., Montgomery 4.

ALASKA: Juneau, September. Sec., Dr. W. M. Whitehead, Box 561, Juneau.

ARIZONA: * Phoenix, Oct. 2-3. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

ARKANSAS: * *Eclectic.* Little Rock, Nov. 8. Sec., Dr. C. H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Oral.* San Francisco, Nov. 11. *Written.* Sacramento, Oct. 15-18. Sec., Dr. Frederick N. Scatena, 1020 N St., Sacramento 14.

CONNECTICUT: * *Medical. Examination.* Hartford, Nov. 13-14. *Endorsement.* Hartford, Nov. 27. Sec. to the Board, Dr. Creighton Barker, 258 Church St., New Haven. *Homeopathic.* Derby, Nov. 13-14. Sec., Dr. J. H. Evans, 1488 Chapel St., New Haven.

FLORIDA: * Jacksonville, Nov. 26-27. Sec., Dr. Harold D. VanSchaick, 2736 S. W. Seventh Ave., Miami 36.

IDAHO: Boise, Jan. 15. Dir., Bureau of Occupational Licenses, Miss Agnes Barnhart, 355 State Capitol Bldg., Boise.

ILLINOIS: Chicago, Oct. 9-11. Supt. of Registration, Department of Registration & Education, Mr. Philip Harman, Springfield.

KANSAS: Topeka, Dec. 6. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. Seventh St., Kansas City 10.

MAINE: Portland, Nov. 13-14. Sec., Board of Registration of Medicine, Dr. A. P. Leighton, 192 State St., Portland.

MARYLAND: *Medical.* Baltimore, Dec. 11-15. Sec., Dr. J. T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, Dec. 11-12. Sec., Dr. J. A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, Nov. 20-23. Sec., Board of Registration in Medicine, Dr. H. Q. Gallupe, 413-F State House, Boston.

MISSISSIPPI: Jackson, Sept. 26-27. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson 113.

MONTANA: Helena, Oct. 1-3. Sec., Dr. O. G. Klein, First Nat'l. Bank Bldg., Helena.

NEW JERSEY: Trenton, Oct. 16-17. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: * Santa Fe, Oct. 8-9. Sec., Dr. LeGrand Ward, 141 Palace Ave., Santa Fe.

NEW YORK: Albany, Buffalo, New York and Syracuse, Oct. 1-4. Sec., Dr. Jacob L. Lochner, Education Bldg., Albany.

NORTH DAKOTA: Grand Forks, Jan. 1. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OHIO: *Endorsement.* Columbus, October. Sec., State Medical Board, Dr. H. M. Platter, 21 W. Broad St., Columbus.

RHODE ISLAND: * Providence, Oct. 4-5. Chief, Division of Examiners, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH CAROLINA: Columbia, Nov. 13. Sec., Dr. N. B. Heyward, 1329 Blanding St., Columbia.

SOUTH DAKOTA: * Pierre, Jan. 15-16. Sec., Medical Licensure, State Board of Health, Dr. Gilbert Cottam, Capitol Bldg., Pierre.

VERMONT: Burlington, March or April 1946. Sec., Dr. F. J. Lawliss, Richford.

WEST VIRGINIA: Charleston, Oct. 4-6. Commissioner, Public Health Council, Dr. John E. Offner, State Capitol, Charleston 5.

WISCONSIN: * Madison, Jan. 8-10. Sec., Dr. C. A. Dawson, Tremont Bldg., River Falls.

WYOMING: Cheyenne, Oct. 1-2. Sec., Dr. G. M. Anderson, Capitol Bldg., Cheyenne.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

CONNECTICUT: Oct. 13. Address State Board of Healing Arts, 250 Church St., New Haven 10.

DISTRICT OF COLUMBIA: Washington, Oct. 22-23. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington.

FLORIDA: DeLand, Nov. 3. Sec., Dr. J. F. Conn, Box 655, DeLand.

IOWA: Des Moines Oct. 9: Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

MICHIGAN: Ann Arbor and Detroit, Oct. 12-13. Sec., Miss Eloise LeBeau, 101 N. Walnut St., Lansing.

MINNESOTA: Minneapolis, Oct. 2-3. Sec., Dr. J. C. McKinley, 126 Millard Hall, University of Minnesota, Minneapolis 14.

NEBRASKA: Omaha, Oct. 2-3. Dir., Bureau of Examining Boards, Mr. Oscar F. Humble, 1009 State Capitol Bldg., Lincoln 9.

SOUTH DAKOTA: December. Sec., Dr. J. D. Alway, Aberdeen.

TENNESSEE: Memphis, Sept. 24-25. Sec., Dr. O. W. Hyman, 874 Union Ave., Memphis.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Workmen's Compensation Acts: Conclusion of Medical Advisory Board Unsupported by Facts Not Binding on Industrial Commission.—While lifting a 70 pound ladder in the course of his employment, April 13, 1942, Tashner lost his balance and in an effort to prevent the ladder from falling on a near-by window he severely wrenched or strained his back, the immediate effect being a sharp pain in the lower part of his back. He completed work that day with considerable difficulty. Thereafter he was bedridden for some time. Admittedly, since the industrial accident he has not been able to perform any manual labor which entailed in any way the use of the back. For the first ten months of 1943 he was under the care and observation of the physicians whose services were paid for by the Industrial Commission of Arizona. The only objective symptoms discovered were a very narrow disk space between the vertebral body and the base of the sacrum, causing them to be almost in contact, and a condition described as fascitis, an inflammation of the tissues covering the left buttock muscles of a cordlike character. Apparently, either of these conditions could have resulted from the trauma and strain incident to the injury. The subjective symptoms were continual pain and tenderness in the region of the lower vertebrae on the left side and the left buttock. Various tests applied by the physicians employed by the commission ruled out any possibility that Tashner's condition was the result of any disease, infection or constitutional or postural defect. Concededly he was not malingering. Significantly, prior to the industrial accident he had never suffered from backache, sustained injury or lost time.

On Nov. 8, 1943 the medical advisory board provided for by the workmen's compensation act of Arizona examined the workman and filed a report finding the medical facts substantially as stated. The board, however, concluded that in its opinion "any disability he may have suffered as the result of his accident has terminated." Based on the opinion of the board, the Industrial Commission ceased payment to him of compensation, which he had been receiving since August 1942. The commission about a year later granted a rehearing to the workman on his claim that his disability still persisted. At the hearing he produced witnesses who testified that from the period of the medical board's findings until the date of the rehearing he continued totally disabled. Reports of the commission's own investigators confirmed this fact. The workman, however, produced no medical expert witnesses to report on his condition at the hearing, allegedly because he was without means to employ them. Nevertheless as a result of the rehearing the commission confirmed its order of the previous year, finding that the workman had no disability as a result of his injury from and after the report of the medical advisory board in November 1943. The workman then brought certiorari to the Supreme Court of Arizona.

This court, said the Supreme Court, has uniformly held that, where an order or finding of the Industrial Commission is based on reasonable evidence, it will be upheld. The only evidence in the record which supports the commission's order is the conclusion of the medical advisory board, as made on Nov. 8, 1943. The sole question is, does this conclusion afford reasonable evidence to support the award? If it does not, the case must be reversed and the order set aside. It is for the Industrial Commission, not the medical advisory board, to determine whether or not disability has ceased. The commission should, and must, give due weight and consideration to the opinion of the medical board, but it is not bound by its conclusions, particularly where the conclusions are wholly unsupported by the actual facts or, as here, contrary to the medical history and findings. It is the medical findings rather than the conclusion which constitute evidence. Obviously a conclusion or opinion which is counter to the actual facts or findings, and which on the face of the record is illogical and without support, cannot be treated as reasonable evidence. We have carefully read the report of the medical advisory board. Various examinations made by competent physicians disclose that the workman's disablement is not the result of any disease, infection or other natural defect. There was no improvement in his condition; he had the same tenderness; the condition described as fascitis still existed. There is no showing that the narrowed disk space between the vertebral body and the base of the sacrum had become normal. The petitioner was still disabled. There is nothing to indicate from the record that the workman's condition was from any cause other than that which might well have resulted from his industrial injury. The report is replete with showings that the workman's condition was not the result of any disease or other like cause, and there is no finding in the report that his condition was not caused by, or was not the result of, the injury. From the medical advisory board's own report we can find no support for its conclusion and therefore hold that no reasonable evidence exists in support of the findings of the Industrial Commission.

The Supreme Court accordingly set aside the award of the Industrial Commission and in effect ordered the continuance of compensation payments to the workman.—*Tashner v. Industrial Commission, 157 P. (2d) 608 (Ariz., 1945).*

Malpractice: Dentists; Extracted Tooth Lodged in Bronchus.—The defendant dentist, after administering "gas and ether," extracted sixteen of the plaintiff's teeth, April 5, 1940. When the patient "came out of the ether" she was nauseated and bled profusely. She returned home, remaining in bed for several days. She had a "bad" cough, suffered a constant pain in the chest and had difficulty in breathing. This condition persisted, and early in May her attending physician sent her to a hospital for roentgenographic examination; but nothing was discovered at that time to account for her condition. For the next fifteen months her chest was sore and she "suffered dry coughing spells and raising of blood" and from time to time she went to a hospital for examination, treatment and the taking of roentgenograms. During a "coughing spell" in July 1941 she disgorged a tooth fragment. Her health immediately began to improve and the pain in her chest disappeared. A review of her "x-ray record" revealed the presence of a tooth fragment in the left lower bronchus. Subsequently she instituted action against the dentist, alleging negligence on his part in permitting the extracted tooth in question "to fall down her throat." At the close of the patient's evidence the trial court directed a verdict in favor of the dentist, and the plaintiff brought exceptions to the Supreme Judicial Court of Massachusetts, Middlesex.

We believe, said the Supreme Judicial Court, that the action of the trial court in directing a verdict in favor of the dentist was error. From the evidence presented, the jury would have been warranted in finding that one of the plaintiff's teeth became lodged in her bronchus and that it got there through the negligence of the defendant while extracting sixteen of her teeth April 5, 1940. This is not a case in which a finding of negligence must rest on mere conjecture. We have not overlooked the fact that the plaintiff offered no expert evidence on the issue of the defendant's negligence. Ordinarily a jury will not be permitted without the aid of expert evidence to determine whether the conduct of the dentist or physician is a breach of the duty owed to a patient. But, although exceptional, the facts in a malpractice case may show that jurymen out of their common knowledge and experience are able to pass on this question. We think that the present case comes within this class.

Accordingly the appellate court in effect reversed the action of the trial court and remanded the cause for further proceedings.—*Malone v. Bianchi, 61 N. E. (2d) 1 (Mass., 1945).*

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1935 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Clinical Pathology, Baltimore

15:165-214 (May) 1945

Lepromatous Leprosy: Reticuloendothelial Disease: Histopathologic Aspects. I. L. Tilden.—p. 165.
Studies on Dientameba Fragilis: Its Incidence and Possible Pathogenicity. Elta W. Knoll and Katharine M. Howell.—p. 178.
Graves' Disease Treated with Thiouracil, with Autopsy Report. R. O. Muether and W. A. D. Anderson.—p. 184.
Effect of Colchicine on Human Tissues. W. O. Brown and L. Seed.—p. 189.
Overlapping of Color Development in Analysis of Thiocyanates and Salicylates in Blood Serum. R. F. Norris, V. E. Martens and F. W. Sunderman.—p. 196
Glomus Tumor of Triceps Muscle: Case Report. W. M. German.—p. 199.
*Cold Isohemagglutinins: Their Association with Hemolytic Anemia and Multiple Thromboses in Primary Atypical Pneumonia: Brief Review of Clinical and Laboratory Problems Involved. W. R. Platt and C. S. Ward Jr.—p. 202.
*Note on Stability of Cold Hemagglutinins. L. A. Erf.—p. 210.

Cold Isohemagglutinins in Primary Atypical Pneumonia.—According to Platt and Ward, cold hemagglutination is generally recognized to be distinct from the better known isoagglutination reactions between the various human blood groups and subgroups. The pseudoagglutination seen in serums with elevated globulin and fibrinogen concentrations and the so-called Huebener-Thomsen phenomenon exhibited in erythrocytes that have been acted on by bacteria, whereupon they demonstrate the property of panagglutination, must also be placed in separate categories. Differing from the atypical warm agglutinins, which are produced by isoimmunization and which react strongly in vitro at 37 C. and which are practically inactive at 25 C., these cold agglutinins show agglutination at 20 C. or lower. The latter agglutinins are also often referred to as autoagglutinins, since they may agglutinate and hemolyze the individual's own corpuscles when the temperature is reduced. The phenomenon occurs in primary atypical pneumonia, complicated mumps, scarlet fever, tonsillitis, measles, Oroya fever, lobar pneumonia, rheumatic heart disease, subacute bacterial endocarditis, kala-azar, chronic tuberculosis, hemolytic anemia, paroxysmal hemoglobinuria, leukemia, pernicious anemia, lymphoblastoma, thrombocytopenic purpura, trypanosomiasis, relapsing fever, hepatic cirrhosis, Raynaud's syndrome, acrogangrene, pregnancy, venous thrombosis, pulmonary embolism, bronchogenic carcinoma and carcinoma of the ileum and following splenectomy. The most significant and consistent occurrence of cold agglutination is that seen in the second week of the majority of cases of primary atypical pneumonia. The authors' patient, a woman with primary atypical pneumonia associated with cold isohemagglutinins, hemolytic anemia and multiple thromboses, required operative amputation for pedal gangrene. Although the reaction per se cannot be said to have any significant specificity, it is of some value in confirming a previous diagnosis of primary atypical pneumonia.

Stability of Cold Hemagglutinins.—Erf studied 2 serums, both of which contained cold agglutinins in exceptionally high titer. The titer of cold agglutinins of the serum of 1 patient was 1:250,000 in the fresh fluid state, 1:16 after thirty days' storage at ice box temperature and 1:8 after fourteen months' storage in the frozen state. Another sample of the serum, which was dried, retained a titer of 1:64 after fourteen months' storage when restored to the isotonic state and 1:256 when restored to two times isotonicity. The cold agglutinins disappeared from the blood of the patient six weeks after the onset of the viral pneumonia. In the second patient the observations on the cold titer were similar to those in the first. This patient had nausea, vomiting and diarrhea of possible viral origin.

American Journal of Diseases of Children, Chicago

69:339-418 (June) 1945

*Effects of Severe Rickets in Early Childhood on Skeletal Development in Adolescence. E. C. Dunham and H. Thoms.—p. 339.
Hemoglobin Values for 2,205 Rural School Children in Florida. O. D. Abbott, Ruth O. Townsend and C. F. Ahmann.—p. 346.
Intestinal Polyparasitism: Clinical Survey of 161 Cases of Infection with Multiple Intestinal Parasites in Children. N. H. Einhorn, J. F. Miller and L. Whittier.—p. 350.
Ancylostomiasis and Strongyloidiasis: Clinical Survey of 71 Cases of Ancylostomiasis and 11 Cases of Strongyloidiasis in Children. J. F. Miller, N. H. Einhorn and L. Whittier.—p. 359.

Rickets in Early Childhood and Skeletal Development in Adolescence.—A group of 10 children who in early childhood had shown evidence of severe rickets were reexamined in adolescence. These 10 subjects were selected by Dunham and Thoms because they were examples of the most severe and prolonged type of rickets occurring in early childhood and not because of any special abnormalities in adolescence. Six of the children were boys, and 4 were girls. On the basis of the pelvic roentgenograms these 10 children fall into two groups: 5 children who had rachitic pelves in adolescence and 5 who had nonrachitic pelves. Of the 5 adolescent children with rachitic pelves 3 were more than 4 years of age when active rickets was diagnosed; of the 5 whose pelves were normal 4 were less than 3 years of age when active rickets was diagnosed. Apparently, the older the child at the time when active rickets of a moderate or severe degree is present, the greater is the chance that the pelvis will show rachitic deformities in adolescence. Physical examination showed that all 10 children had in adolescence some deformity of the lower extremities. In the children who had had severe rickets in early childhood knock knees were associated more often with rachitic deformities of the pelvis than were bow legs. Severe or moderate deformities of the spine or of the lower extremities were found in early childhood as often in the group with normal pelves in adolescence as in the group with rachitic pelves. Differences in the two groups were found in the incidence of knock knees in early childhood: Of the 5 children with rachitic pelves in adolescence 2 had had knock knees in early childhood and 2 had had bow legs. Of the 5 children with normal pelves in adolescence none had had knock knees in early childhood. Observations suggest that if knock knees were present in early childhood the pelvis in adolescence is more likely to show the deformities of rickets than if bow legs were present in early childhood.

American Journal of Medical Sciences, Philadelphia

209:701-832 (June) 1945

Therapeutic Use of Radioactive Phosphorus. S. Warren.—p. 701.
Radioactive Phosphorus in Treatment of Polycythemia Vera: Results and Hematologic Complications. B. E. Hall, C. H. Watkins, M. M. Hargraves and H. Z. Giffin.—p. 712.
Recent Studies on Yellow Bone Marrow Extracts. J. E. Caldwell, R. H. Sifferd, J. D. Porsche and F. Fenger.—p. 717.
*Abdominal Crises in Uncomplicated Sickle Cell Anemia: Clinicopathologic Study of 11 Cases, with Suggested Explanation of Their Cause. W. J. Tomlinson.—p. 722.
Artificial Production and Significance of Target Cells, with Special Reference to Their Occurrence in Thalassemia (Cooley's Erythroblastic Anemia). W. N. Valentine and J. V. Neel.—p. 741.
Case of Eczema as Source of Streptococcal Epidemic. G. K. DeForest and Loraine M. Kerr.—p. 752.
Effect of Simultaneous Tuberculous Infection on Experimental Trichinella Infestations in Guinea Pigs. O. T. Davis, G. T. Harrell and E. S. King.—p. 758.
Clinical Aspects of Pain in Chest: II. Pain Arising from Esophagus. T. R. Harrison.—p. 765.
Id.: III. Pain Arising from Stomach. T. R. Harrison.—p. 771.
*Penicillin in Treatment of Intractable Bronchial Asthma: Preliminary Report. S. S. Leopold and R. A. Cooke.—p. 784.

Abdominal Crises in Sickle Cell Anemia.—Tomlinson of the Gorgas Hospital in the Canal Zone describes a clinicopathologic picture of abdominal crises in 11 uncomplicated cases of sickle cell anemia. Four of the patients were dead on arrival at the hospital or died before they were seen by a physician. All but 3 of the patients were children less than 6 years of age, the 3 being 9, 11 and 18 years of age respectively. Of the

7 patients examined during life, 5 were in shock. The clinical picture was characterized by sudden onset of distress, pain, rigidity or tenderness in the abdomen usually accompanied by nausea and vomiting, occasional pain or tenderness in the muscles and bones, severe malaise, chill and fever; frequent jaundice, early, rapid peripheral vascular collapse with shock and central nervous system involvement. Clinical laboratory studies revealed severe normochromic anemias with an absolute increase in mononuclear cells; nucleated erythrocytes and sickled forms were an almost constant finding, and the icterus indexes were increased. Postmortem examinations revealed congestive and degenerative changes in the capillaries and small venules of the brain, pyramidal cell degeneration, glial proliferation and corpora amylacea. In the hearts there were hypertrophy, fatty changes, albuminous degeneration, edema and fragmentation of the myocardial fibers. The livers showed congestion and extensive phagocytosis of sickled erythrocytes by the reticuloendothelial cells, and the same findings were present in the lymph nodes. The spleens were enlarged in 8 of the 11 cases and showed congestion and "pooling," together with fibrosis of the capsule, trabeculae and reticular stroma. The clinical symptoms at the onset of abdominal crises in sickle cell anemia are remarkably similar to Wintrobe's description of the symptoms of rapid destruction of blood. It is felt that the symptoms are due at first to increases in the number of sickled cells and their removal from the circulation with rapidly developing shock. A possible explanation for the shock is that the anoxia accompanying anemias is increased in severity in sickle cell anemia, as sickled erythrocytes do not carry or are poor carriers of oxygen to the body tissues; the heart in severe anemia is weakened; sickled erythrocytes have a tendency to pack or jam in small capillaries; the capillary anoxia results in plasma loss, hemoconcentration and stagnation, and the stagnation removes available erythrocytes from the circulation, increasing circulatory failure and anoxia and perpetuating the vicious cycle of shock. Transfusions may greatly alter the clinical picture. Transfusions must not be given from persons showing the sickling trait.

Penicillin in Bronchial Asthma.—Leopold and Cooke present the histories of 2 patients with intractable continuous bronchial asthma. The first patient was given intramuscular injections of penicillin until a total of 1,375,000 units had been given, the daily dose being 100,000 units. The second patient was given the same daily dose for ten days. In the first patient, following treatment, there was complete remission of asthmatic symptoms for almost four months, although frequent examinations of the lungs during this time revealed the almost constant presence of sibilant rales. No such remission had occurred in the fifteen previous years. An acute upper respiratory infection produced the expected recurrence of asthma; its subsidence has been followed by subjective relief, although sibilant rales were usually present. In case 2, four months have elapsed with no subjective asthma. Twenty-five additional patients with intractable asthma have either been treated with penicillin very recently or are under treatment at the present time. Penicillin is not a panacea for all cases of asthma due to infection, for some patients have shown no improvement after penicillin therapy. It is possible that this drug may be helpful in treatment of two groups of asthmatic patients: those with both extrinsic and intrinsic asthma, provided the extrinsic factors are properly controlled, and those who have only intrinsic disease. It is possible that penicillin may be of value in that group of cases in which the bacteria recovered from the sputum or from the upper respiratory tract are shown to be sensitive to penicillin in vitro.

American Review of Soviet Medicine, New York

2:388-480 (June) 1945

Orthopedic Surgery in USSR. V. D. Chaklin.—p. 388.
Treatment of War Injuries of Sekeletal System. P. D. Wilson.—p. 395.
Orthopedic Surgery in USSR and U. S. A. T. F. Cooper.—p. 406.
Agonal States and Clinical Death: Problems in Revival of Organisms. V. A. Negovski: Chapter III. Respiration and Circulation During Death and Revival of Exsanguinated Animal.—p. 408.
Anabasine Sulfate: Protective Agent Against Bites of Malarial Mosquitoes. V. A. Nabokov.—p. 449.
Treatment of Peripheral Nerve Trauma. M. L. Borovski.—p. 453.

American Review of Tuberculosis, New York

51:489-600 (June) 1945

*Tuberculosis as a Military Problem. E. R. Long.—p. 489.
Thoracoplasty: Report on 240 Consecutive Patients. P. D. Crimm.—p. 505.
Conversion of Pulmonary Secretions Following Collapse Therapy. J. D. Steele.—p. 514.
Bronchography in Pulmonary Tuberculosis: IV. Geographic Adventure. B. A. Dormer, J. Friedlander and F. J. Wiles.—p. 519.
Roentgenology of Massive Conglomerate Lesions of Silicosis. M. R. Camiel.—p. 527.
*Effect of Altitude on Abnormal Accumulations of Air in Chest. E. Bridge and E. Bridge.—p. 532.
Tuberculin Testing of Pregnant Women. M. J. Seid.—p. 537.
Patient Education in Rehabilitation. Helen M. Becht.—p. 539.
Penicillin in Treatment of Pyogenic Empyema Complicating Therapeutic Pneumothorax: Report of 2 Cases. K. S. Howlett Jr., and D. E. Lester.—p. 546.
Military Tuberculosis of Liver. G. A. Wolf Jr., and C. M. Flory.—p. 553.
Blood Iodine in Pulmonary Tuberculosis. K. P. Klassen, Elsie L. Riley and G. M. Curtis.—p. 561.
In Vitro Phagocytosis: In Vitro Phagocytic Cell Sensitivity in Normal, Tuberculoanaphylactic, Tuberculoallergic and Tuberculous Guinea Pigs. H. J. Corper, M. L. Cohn and R. E. Stoner.—p. 566.
Spleen Appearance Time of Tubercle Bacilli as Related to Dosage of Bacilli. C. E. Woodruff, Ruby G. Kelly and Mary A. Leaming.—p. 574.
Chemotherapeutic Testing in Experimental Tuberculosis: Suggested Outline of Laboratory Procedures for Testing Antituberculosis Substances in Experimentally Infected Animals. W. H. Feldman and H. C. Hinshaw.—p. 582.

Tuberculosis a Military Problem.—According to Long, exclusion of tuberculosis from the Army in the first world war was carried out by physical examination. Auscultation of the chest was skilful and possibly superior in character to that practiced today. It was far inferior in the detection of tuberculosis to modern x-ray methods. While physical examination of the chest is an integral part of induction station examinations, maximum reliance is placed on the x-ray appearance. Nothing illustrates more clearly the value, and at the same time the limitations, of preinduction x-ray examinations than a comparison of the admission rates for tuberculosis in the first world war and in the present war. The rate in the war of 1914-1918 was approximately ten times that for the present war. It must not be assumed, however, that the difference is entirely due to improved methods of detection in the present war. Fewer cases, relatively, were to be excluded in the present war, for the incidence of tuberculosis in the general population at the present time is approximately one third of that prevailing in the period of the first world war. Cases developing in the United States Army in the present war for the most part represent extension from small areas of infiltrative tuberculosis not previously detected. Extension from scarred and calcified primary lesions has not been demonstrated. Statistics suggesting an increasing amount of exogenous infection overseas have been reported in the Canadian army, but indications are not yet at hand of a comparable situation in our army. The predominant type of tuberculosis occurring in our army is the chronic, ulcerative, pulmonary form. Acute forms are relatively rare, at least in the white race, and up to the present, while numerous advanced cases have been returned from overseas, indications are not evident that climate or any specific environment is a factor in the development of fulminating disease. Great progress has been made in evacuation of patients, particularly by air. All active tuberculosis is cause for discharge, but arrangements are in effect for preliminary treatment in the Army and indoctrination on the great importance of continuation of care after separation from the service and establishment of veteran's status.

Effect of Altitude on Air in Chest.—Civil aircraft usually fly at altitudes less than 10,000 feet above sea level, but higher altitudes may be occasioned by mountainous country or storms. The Bridges point out that exposure to lowered barometric pressures will cause expansion of abnormal accumulations of gas in the patient's chest, depending on the rigidity of the tissue walls enclosing the gas. The enclosing walls of uncomplicated intrapleural pneumothorax present the least resistance to gaseous expansion, because the elasticity of the lungs encourages their collapse. The hazard of reduced barometric pressure is magnified by increasing altitude, and the greater the amount of gas producing the pneumothorax the greater will be the collapse of

the lung. A patient carrying 1,000 cc. of intrapleural air at sea level will have the equivalent of 1,490 cc. at 10,000 feet and 2,120 cc. at 18,000 feet. With an increase in effective pneumothorax there can be a contralateral shift of the mediastinum and partial collapse of the opposite lung. It is apparent that pneumothorax which is tolerable for the patient at sea level could endanger his life at a high altitude. Pneumothorax complicated by mediastinal hernia or by visceroparietal adhesions offers the risk of increasing the hernia or rupturing the adhesions. The greater the tension of the adhesions, the more likely they are to rupture. A pulmonary cavity, unless communicating freely with a bronchus or possessing very rigid walls, could be expected to expand. Expansion of the cavity might rupture its walls, disseminate infective material or induce hemorrhage by severing vessels traversing the cavity. Expansion of gas producing mediastinal and subcutaneous emphysema could cause further dissection by emphysematous tissue when subjected to reduced pressure. The following conditions contraindicate air travel for patients with abnormal accumulations of air in the chest: (1) cyanosis or dyspnea, (2) recent hemoptysis, (3) visceroparietal adhesion, (4) mediastinal hernia, (5) mediastinal displacement, (6) pulmonary cavity containing fluid or with signs of intermittent bronchial communication or with closed bronchial communication, (7) mediastinal emphysema and (8) pulmonary emphysema with dyspnea. They believe that air travel should be restricted to those patients who would have no respiratory or circulatory distress and no physical discomfort if the abnormally accumulated air in the chest was doubled.

Archives of Neurology and Psychiatry, Chicago

53:399-464 (June) 1945

Disturbances in Sleep Mechanism: Clinicopathologic Study—I. Lesions at Cortical Level. C. Davison and E. L. Demuth.—p. 399.
*Denial of Blindness by Patients with Cerebral Disease. F. C. Redlich and J. F. Dorsey.—p. 407.
Synkinetic Pupillary Phenomena and Argyll Robertson Pupil. M. B. Bender.—p. 418.
Lateral Spinothalamic Tract and Associated Tracts in Man. E. Gardner and H. M. Cuneo.—p. 423.
Electroencephalographic Findings in Cases of Bromide Intoxication. M. Greenblatt, S. Levin and B. Schegloff.—p. 431.

Denial of Blindness by Patients with Cerebral Disease.—Redlich and Dorsey observed 6 instances of denial of blindness over a period of eighteen months in a 600 bed hospital. Most examiners are reluctant to make any attempt to stress forcibly to the patient such a severe defect as blindness. All patients who present such a syndrome are deteriorated and have disturbances of retention and orientation, hallucinations and delusions. The syndrome of denial of their own blindness in the authors' patients was caused by diabetic retinopathy in 1 patient, by atrophy of the optic nerve in another, and by bilateral hemianopsia due to tumor or to vascular lesions in 4 patients. All patients had diffuse cerebral lesions. All showed intellectual deterioration: disorientation, severe impairment of recent memory and retention, and confabulation. The existence of bilateral focal lesions of the visual radiations or of the occipital visual areas leading to bilateral hemianopsia seems to play an important part in the pathogenesis of the syndrome. The interruptions of reverberating circuits between the thalamus and the sensory cortex constitute the most prominent etiologic factor.

Archives of Ophthalmology, Chicago

33:429-516 (June) 1945

Treatment of Bilateral Retinoblastoma (Retinal Glioma) Surgically and by Irradiation: Report on Progress. H. Martin and A. B. Reese. p. 429.
Ocular War Neuroses. H. L. Birge.—p. 440.
Electron Microscopic Observations on Bacteriolysis Produced by Lysozyme of Tears. B. Babudieri and G. B. Bietti.—p. 449.
Penicillin Therapy of Infections of Vitreous. L. Von Sallmann.—p. 455.
Influence of Local Application of Sulfonamide Compounds and Their Vehicles on Regeneration of Corneal Epithelium. I. H. Leopold and W. H. Steele.—p. 463.
Choroideremia: Report of Case. H. Magder.—p. 468.
Parinaud's Oculoglandular Syndrome Due to Yeastlike Organism. F. H. Theodore.—p 471.
Management of Paralysis of Divergence. S. Kamellin.—p. 476.
Visual Exercises in Ophthalmology. J. I. Pascal.—p. 478.

Archives of Surgery, Chicago

50:223-276 (May) 1945

Subtotal Gastrectomy. E. R. Schmidt and D. W. Melick.—p. 223.
Postoperative Gouty Arthritis. B. J. Ficarra and R. Adams.—p. 229.
Acrylic Resin as Implant for Correction of Facial Deformities. K. W. Penhale.—p. 233.
Anomalous Fusion of Scaphoid and Greater Multangular Bone. M. G. Henry.—p. 240.
Degenerative White Blood Cell Picture as Indication of Toxemia from Burns. J. Van Duyn II.—p. 242.
Congenital Malformations of Anus and Rectum: Clinical Study. E. T. Dmytryk.—p. 253.
Acute Appendicitis in Childhood. H. W. Scott Jr. and P. F. Ware. —p. 258.
Surgical Treatment of Lymphedema. J. L. Ransohoff.—p. 269.
*Internal Derangements of Knee Joint. R. F. Jaekle.—p. 271.

Internal Derangements of Knee Joint.—Jaekle reports 190 arthrotomies of the knee joint performed in military personnel in the Station Hospital, Camp Roberts, Calif., within a two year period. An equal number of patients with affected knee joints were not operated on and have since been reclassified or discharged. Many of these patients had deranged joints before their entry into the service and had been advised by their own physicians not to have operations. The patient was taught exercises for the quadriceps muscle before the operation and was impressed with the idea that his cooperation was the deciding factor in a successful operation. Analysis of operative results in 155 cases of torn semilunar cartilages showed that lack of immobilization, early exercises and weight bearing give quicker return of function. Simple excision of bucket handle tears is sufficient, and in so-called complete excision a thin margin of cartilage should remain. One hundred and thirty-two men (85.16 per cent) have returned to duty on an average of twenty-five days following operation for injuries incurred from a few days to eleven years before. The results justify immediate operation because the total time lost from recurrence of injury will be considerably more with conservative treatment. The longer the torn cartilage remains the more likely it is that joint surfaces will become damaged and that a complete cure cannot be obtained. Hypertrophic fat pads are not generally recognized as a frequent derangement of the knee joint, but operation is warranted because of recurrences of symptoms and possible damage to the joint.

Bull. of the U. S. Army Med. Dept., Washington, D. C.

4:1-122 (July) 1945

Problems of Disease in Far East. F. R. Dieuaide.—p. 57.
Medical Aspects of Amphibious Operations in Pacific Ocean Areas. J. M. Willis and G. J. Menaker.—p. 61.
Scrub Typhus. R. O. Sather and J. S. Silberstein.—p. 68.
Prosthesis of Eye in Synthetic Resin: Preliminary Report. S. F. Erpf, V. H. Dietz and M. S. Wirtz.—p. 76.
*Treatment of Diphtheria Carriers with Penicillin. B. B. Berman and S. H. Spitz.—p. 87.
Combat Psychiatry. C. S. Drayer and S. W. Ranson.—p. 91.
Meningococcic Pneumonia. N. B. Roberg.—p. 97.

Treatment of Diphtheria Carriers with Penicillin.—Berman and Spitz applied penicillin locally to the nose and throat of a group of diphtheria carriers in an attempt to revert them quickly to a noncarrier status. A patient was not considered a carrier unless diphtheria organisms had been found in culture of the nasopharynx for a period of more than three weeks. In a group of diphtheria cases, 22 fell into this category. These were divided into a control and a treated group. The control group of 12 cases had had positive cultures for Corynebacterium diphtheriae for four weeks. The treated group of 10 patients likewise had been positive for four or five weeks. The penicillin was dissolved in isotonic solution of sodium chloride so that 1 cc. contained 500 Oxford units. By means of an ordinary nose dropper, 1 cc. of this solution was instilled into both nares four times each day for five days. Immediately after instillation another 1 cc. was sprayed with an atomizer onto the fauces and posterior wall of the pharynx. The total amount of penicillin used per patient throughout the five day course was 20,000 units. The control group of patients was treated with hot saline gargles four times daily. In the 10 treated cases the throat cultures became negative within the treatment period or on the first day after cessation of therapy. Seven of the 12 patients in the untreated group reverted to

negative within the fifth week. The remaining 5 continued to be positive for six to seven weeks, after which it was decided to treat them with penicillin. All of these cases became negative as in the treated group; that is, within the five days of therapy or on the first day thereafter.

Bulletin of Johns Hopkins Hospital, Baltimore

76:179-220 (May) 1945

Sjögren's Syndrome. A. L. MacLean.—p. 179.
Further Observations on Self-Regulatory Dietary Selections of Rats Made Diabetic by Pancreatectomy. C. P. Richter, E. C. R. Schmidt Jr. and P. D. Malone.—p. 192.

California and Western Medicine, San Francisco

62:305-370 (June) 1945

*Fenestration Operation for Deafness. R. C. Martin.—p. 311.
Ambulatory Patients at Langley Porter Clinic: Their Management. —p. 312.
California State Board of Medical Examiners. F. N. Scatena.—p. 315.
Central Medical Registry: Some Thoughts Regarding Its Need. J. M. Askey.—p. 317.
Common Recalcitrant Dermatoses. J. L. Fanning.—p. 318.
Cerebral Vascular Accidents: Their Effect on State of Consciousness. C. W. Olsen.—p. 319.

Fenestration Operation for Deafness.—Several factors having to do with this operation will not be cleared up until enough cases have been amassed to allow for their proper evaluation. The oldest cases in which operation has been performed are now some six years since operation. In some of these the maintenance of improvement is remarkable. Martin sees no reason to suppose that the degeneration of the nerve will be halted by the operative procedure. This factor will have to await passage of time before it can be evaluated. If Gray's theory that the nerve change is primary and the bony change is trophic is correct, it will eventually prove that there will be no arrest of the disease by the operative procedure. As to the advantages of this procedure over wearing a hearing aid, those who have had a hearing aid and then obtained a successful fenestration result claim that there is no distortion of speech and that the selective amplification of speech over the attendant noises in everyday life returns as soon as their hearing improvement has become manifest after the operation. This amplification of incidental noises is one of the chief complaints against the hearing aids. The worse ear is usually operated on, and in the event of its loss through misadventure during the operation there is still a useful ear on which the hearing aid can be used.

Cancer Research, Baltimore

5:385-448 (July) 1945

Histogenesis of Benzpyrene-Induced Epidermal Tumors in Mouse. A. Glücksmann.—p. 385.
Disappearance of Carcinogenic Hydrocarbons in Autoxidizing Lipids. G. C. Mueller, J. A. Miller and H. P. Rusch.—p. 401.
On Tumor Producing Chemical Substances. L. M. Shabad.—p. 405.
Methylcholanthrene Papillomas and Virus Problem. W. H. Woglom. —p. 420.
Effect of X-Rays on Transmissibility of Fowl Sarcoma in Its Nonfiltrable Phase. B. Miszurski, M. Pikovski, G. Goldhaber and L. Doljanski.—p. 422.
Effect of Progesterone and Testosterone Propionate on Incidence of Mammary Cancer in Mice. J. Heiman.—p. 426.
Influence of Caloric Restriction and of Dietary Fat on Tumor Formation with Ultraviolet Radiation. H. P. Rusch, B. E. Kline and C. A. Baumann.—p. 431.

Endocrinology, Springfield, Ill.

36:291-354 (May) 1945

Relation Between Tyrosinase and Estrinase in Potato Extracts. B. Zondek and M. Finkelstein.—p. 291.
Effects of Oral and Parenteral Administration of New Synthetic Estrogen Benzestrol in Rat. E. W. Blanchard and R. B. Stebbins.—p. 297.
Effects of New Synthetic Estrogen Benzestrol on Hemopoietic System in Rat. R. B. Stebbins and E. W. Blanchard.—p. 305.
Influence of Estradiol and Testosterone Propionates on Skeletal Atrophy from Disuse and on Normal Bones of Mature Rats. W. D. Armstrong, Marjorie Knowlton and Mary Gouze.—p. 313.
Assay of Antidiuretic Material in Blood and Urine. K. Hare, Eleanor V. Melville, G. H. Chambers and Ruth S. Hare.—p. 323.
Antidiuretic Material in Supraoptic Nucleus. Eleanor V. Melville and K. Hare.—p. 332.
Effect of Adrenalectomy on Epiphysial Cartilage of Rat. L. C. Wyman and Caroline Tum-Suden.—p. 340.

Epidemiological Information Bull., Washington, D. C.

1:365-402 (June 15) 1945

Standards for Manufacture and Control of Yellow Fever Vaccine. —p. 365.
Smallpox at Bay and at Large. K. Stowman.—p. 371.
Current Reports on Prevalence of: A. Plague, Cholera, Yellow Fever, Smallpox and Typhus.
Id.: B. Diphtheria.—p. 393.
Trend of Notifiable Diseases.—p. 394.

1:403-452 (June 30) 1945

Increase of Syphilis in Europe.—p. 403.
Spread of Scabies.—p. 405.
Significance of Death Rates.—p. 406.
International Sanitary Convention for Aerial Navigation of April 12, 1933. Modified by International Sanitary Convention for Aerial Navigation 1944.—p. 410.
Current Reports on the Prevalence of: A. Plague, Cholera, Yellow Fever, Smallpox and Typhus.—p. 439.
Id.: B. Typhoid Fever, Paratyphoid Fevers and Poliomyelitis.—p. 450.

Illinois Medical Journal, Chicago

87:217-268 (May) 1945

Occupational Dermatoses (Diagnosis, Management, Prevention). C. J. White.—p. 227.
Recent Trends in Radiation Therapy of Cancer. R. T. Pettit.—p. 232.
Problems in Care of Newborn. E. T. McEnery.—p. 237.
Value of Spot Films in Radiography of Gastrointestinal Tract. F. L. Hussey.—p. 242.
Edema of Eyelids in Infections of Paranasal Sinuses. M. R. Folk and H. Brunner.—p. 245.
Gonorrheal Ophthalmia Neonatorum: Case Report. A. A. Baraff.—p. 249.
*Irritative Effects of Smoke from Tobacco Treated with Glycerin and Diethylene Glycol. W. D. McNally, W. Bergman and R. H. K. Foster. —p. 250.

Iowa State Medical Society Journal, Des Moines

35:247-320 (July) 1945

Malaria in Returning Service Personnel. P. F. Russell.—p. 247.
Ringworm of Scalp Due to Microsporon Audouini: Report of Cases. —p. 253.
Chronic Hemolytic Anemia with Paroxysmal Nocturnal Hemoglobinuria: Case Report. J. E. Flynn.—p. 255.

35:321-352 (Aug.) 1945

Calcium Phosphate Renal Lithiasis: Important Aspects in Symptomatology, Diagnosis and Treatment. R. H. Flocks.—p. 321.
Bronchial Asthma. G. E. Mountain.—p. 324.
Poliomyeloencephalitis (Anterior Poliomyelitis). J. E. Flynn.—p. 327.

Journal of Aviation Medicine, St. Paul

16:47-108 (April) 1945

Night Blindness in Flying Personnel: Observations on Patients Studied at AAF School of Aviation Medicine. W. M. Rowland and L. L. Sloan.—p. 49.
*Effect of Hyoscine on Airsickness. J. L. Lilienthal Jr.—p. 59.
Aviation Nutrition Studies: I. Effects of Preflight and Inflight Meals of Varying Composition with Respect to Carbohydrate, Protein and Fat. C. G. King, H. A. Bickerman, Winifred Bouvet, C. J. Harrer, J. R. Oyler and C. P. Seitz.—p. 69.
Application to Commercial Aviation of Some Physiologic Factors Developed by Military Aviation Medicine. L. G. Lederer.—p. 85.
Spontaneous Subarachnoid Hemorrhage Occurring in Pilot During Flight. J. O. W. Rash and F. M. Goldys.—p. 91.
Episcleritis in Flying Officer. L. J. Agin.—p. 96.
Effect of Thiourea on Mice Undergoing an Abrupt Reduction of External Atmospheric Pressure. T. S. Gardner and F. B. Forbes. —p. 99.
Further Study on Muscular Cramps and Hyperventilation Syndrome in Fliers in ETO. W. G. Beckman.—p. 101.

Effect of Scopolamine on Airsickness.—A preventive and curative effect has long been ascribed to scopolamine in seasickness. The pharmacologic rationale for the use of scopolamine in motion sickness is based on its anticholinergic activity and its well recognized sedative and tranquilizing central effects, but the actual mode of action is unknown. In contrast to atropine, to which it is closely related, scopolamine in therapeutic doses produces little or no mydriasis, cycloplegia, tachycardia or suppression of salivation and sweating. These properties make scopolamine peculiarly adapted for use in aviation. Lilienthal investigated the effect of scopolamine hydrobromide on motion sickness in aircraft in a group of aviation cadets. These subjects were well suited to this study by virtue of their previous flight experience (approximately two hundred hours) and because they spent two thirds of these flights in nonpiloting duties, in which airsickness is more likely to develop. On 531 cadet flights, when no drug was administered, 40 cadets became

obviously airsick, an attack rate of 7.5 per cent. On 200 cadet flights, when 0.6 mg. of scopolamine was administered perorally thirty to sixty minutes before flight, only 1 man became airsick, an attack rate of 0.5 per cent. On 239 subsequent cadet flights each cadet was given a lactose placebo indistinguishable from the scopolamine. In this group 15 cadets became airsick, an attack rate of 6.3 per cent. Encouraging results were encountered in the prevention of airsickness in individual susceptible subjects. The author concludes that scopolamine hydrobromide in doses of 0.6 mg. administered perorally thirty to sixty minutes before flight is a potent preventive of airsickness with insignificant side effects.

16:109-208 (June) 1945

*Autokinetic Illusion and Its Significance in Night Flying. A. Graybiel and B. Clark.—p. 111.
*Development of Active Pulmonary Tuberculosis as Probable Result of Decompression Sickness at Simulated Altitudes Above 40,000 Feet. A. L. Barach, A. E. Johnson and C. Rule.—p. 152.
Duration of Consciousness in Anoxia at High Altitudes. C. G. Mackenzie, A. H. Riesen, J. R. Bailey, T. N. Tahmisian and P. L. Crocker.—p. 156.
Quarantine Procedures with Special Reference to Air Travel. T. B. Magath.—p. 165.
Naval Aviation Safety Program. M. T. Martin and K. S. Scott.—p. 175.
Nutritional Control of Foods Served in Royal Canadian Air Force. J. W. Tice, F. F. Tisdall and J. F. McCreary.—p. 181.
Survival Off the Land. R. A. Howard.—p. 187.
Immediate Treatment of Burns at Naval Air Stations. J. G. Stubenbord 3d.—p. 192.
Personal Equipment Officers and Care of Flier in AAF. S. R. M. Reynolds.—p. 202.

Autokinetic Illusion in Night Flying.—Graybiel and Clark found that autokinesis is universally experienced by normal persons. The period of delay before the onset of movement is almost always short, averaging approximately nine seconds. The median duration of a movement in a particular direction is approximately ten seconds. Movement is observed about half of the time. The rate of movement is usually slow but may be rapid. The angular displacement for most movements is not great, but exceptionally a large displacement occurs. Movement is seen in all directions. Voluntary control, including suppression of movement, is limited. Although the illusory effect increases and decreases respectively with increase and decrease of the visual frame of reference, it is not readily abolished. Under relatively simple conditions in the laboratory, which simulate certain features of flying in formation at night, the subject is frequently confused. He cannot always tell when a particular movement of the target begins or ends and often cannot distinguish real from apparent movement. Autokinesis is readily observed under favorable conditions during formation flights at night and probably offers the explanation for some of the accidents that have occurred. Autokinesis is decreased by factors which improve the spatial localization of objects, by rapid relative movement of the target and by periodically withdrawing the attention from an object for at least ten seconds. If it is not feasible adequately to reduce autokinesis, help can come through a knowledge of its characteristics. All aviators and probably the operators of certain other means of transportation should be made aware of the characteristics of this phenomenon and of the practical means by which it can be reduced, namely (1) using some fixed object (for example, the framework of any opening or part) as a reference point, (2) periodically interrupting any steady fixation of a target light, and (3) in case of doubt regarding the reality of an observed movement, placing reliance on the instruments, if these conflict with the pilot's perceptions.

Active Pulmonary Tuberculosis and Decompression Sickness.—Barach and his associates found that 2 physicians developed active pulmonary tuberculosis during the course of repeated exposure to altitudes of 42,000 feet. This exposure did not produce the original disease. It is considered probable that previous lesions were quiescent but were reactivated by local trauma to the lung parenchyma produced when air or other gases expanded in or near a tubercle. It is thought that air might have become trapped in an area of tuberculous infiltration or that bubbles of gaseous nitrogen formed within the tubercle during exposure to a low pressure atmosphere. In the case of gases trapped in the lung, this would amount to an increase of 8.8 times the sea level volume at an altitude of 42,000 feet. Disruptive forces, such as expansion of gases and greater pressure differentials, might result in the tearing and rupture of a tubercle with cavity formation and liberation of viable tubercle bacilli into uncontaminated areas of the lung. The dangers described are unlikely when personnel are exposed to altitudes less than 18,000 feet, as in commercial flying.

Journal of Infectious Diseases, Chicago

76:163-240 (May-June) 1945

Production in Vitro of Substances Resembling Antibodies from Bacteria. E. C. Rosenow.—p. 163.
Studies on Pathogenesis of Leptospirosis. A. B. Stavitsky.—p. 179.
Antibacterial and Fungistatic Properties of Propamidine. W. O. Elson.—p. 193.
Neutralization of Poliomyelitis Virus by Dog Serums. F. B. Gordon.—p. 198.
Antibody Response to Strains of Influenza A and Swine Influenza Viruses in Serums of Infants Experiencing First Infection with Influenza A. E. R. Rickard, M. P. Thigpen and J. M. Adams.—p. 203.
*Effect of Triethylene Glycol Vapor on Air Borne Beta Hemolytic Streptococci in Hospital Wards: II. Combined Action of Glycol Vapor and Dust Control Measures. T. T. Puck, M. Hamburger Jr., O. H. Robertson and Valerie Hurst.—p. 216.
Distribution and Localization of Sporozoites and Preerythrocytic States in Infections with Plasmodium Gallinaceum. F. Coulston, W. Cantrell and C. G. Huff.—p. 226.

Glycol Vapor and Dust Control.—Puck and his associates report that the introduction of triethylene glycol vapor into the air plus the application of dust control measures to the floors and bedclothes of streptococcus sore throat wards resulted in a reduction in the number of air borne beta hemolytic streptococci of 93 per cent when the wards were quiet and 97 per cent during bed making periods. The dust prevention treatment by itself lowered the streptococcus count by 86 per cent during bed making but not at all when the ward was quiet. However, when glycol vapor was introduced into a ward in which dust prevention was already in effect there resulted a further reduction of the residual streptococci present in the air during both quiet and bed making periods. Glycol vapor concentrations maintained at a level just below the fogging point were found to be as effective as supersaturated atmospheres. The authors believe that the combination of triethylene glycol vapor plus dust preventive treatment of floors and bedclothes offers a promising means of controlling air borne infection in hospital wards.

Journal-Lancet, Minneapolis

65:235-264 (July) 1945

Indications for Bronchoscopy in Pulmonary Disease. P. H. Holinger.—p. 256.
Fatigue as Symptom in Depressed Patients. G. R. Kamman.—p. 238.
Malaria: Medical Observations in South China and Notes on Health Situation in an Internment Camp Under the Japanese. C. W. Lawson.—p. 241.
Roseola Infantum. O. M. Moore.—p. 243.
Needle Biopsy of Liver. F. W. Hoffbauer.—p. 246.
Ophthalmology. E. W. Hansen.—p. 248.
Use of Passive Transfer or Indirect Method of Skin Testing in Allergic Diseases. F. W. Wittich.—p. 249.
Allergy in Dermatology. C. W. Laymon.—p. 251.
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Glomus Tumor. J. F. Pohl.—p. 253.
Management of Acne Vulgaris. H. A. Cumming.—p. 254.
Resection of Pancreas for Hyperinsulinism Due to Islet Cell Tumors. S. R. Maxeiner.—p. 256.

Journal of the Mount Sinai Hospital, New York

12:1-802 (May-June) 1945. Partial Index

Diagnostic Difficulties in Uncomplicated Syphilitic Aortitis, with Note on Roentgenkymography of Aorta. S. H. Averbuck.—p. 41.
Multiple Purulent Arthritis Due to Meningococcus in Very Early Infancy: Report of Case in Infant Suffering from Congenital Cataract and Cardiac Disease Whose Mother Had Rubella During First Month of Pregnancy. M. H. Bass and G. Nothman.—p. 60.
Arcus Senilis and Arteriosclerosis. E. P. Boas.—p. 79.
Reliability of Serologic Tests for Syphilis. L. Chargin and C. R. Rein.—p. 111.
Evaluation of Kenny Treatment of Poliomyelitis. A. E. Fischer.—p. 200.
Generalized Secondary Amyloidosis: Clinicopathologic Study of 84 Cases. M. Jacobi and H. Grayzel.—p. 339.
Clinical Significance of Pain in Acute Coronary Occlusion with Myocardial Infarcation. M. A. Kugel.—p. 422.
Description of Epidemic Caused by Salmonella Typhi-Murium and Bacteriology of This Organism. D. H. Ross.—p. 584.
Dissemination and Control of Meningococcal Infections. E. B. Schoenbach and J. J. Phair.—p. 624.
Moenckeberg's Sclerosis: Clinical Entity. S. Silbert and H. I. Lippmann.—p. 689.

Journal of National Malaria Society, Tallahassee, Fla.

4:77-150 (June) 1945

Development and Use of DDT for Control of Mosquitoes. E. F. Knipling.—p. 77.
Construction and Operation of 4 Inch Hydraulic Dredge for Malaria Control Drainage. L. G. Lenert and W. A. Legwen.—p. 93.
Report on Use of Diaphragm Pump and Tide Gates on Malaria Control Project at Harvey Point, N. C. R. W. Jones.—p. 99.
Military Aspects of Malaria Control in Fourth Service Command. S. C. Dews and J. H. Morgan.—p. 105.
Incidence of Malaria Among Troops in Liberia. L. D. Moore. —p. 109.
Anopheline Surveys in Fourth Service Command. S. J. Carpenter. —p. 115.
Directional Mosquito Barrier Trap. W. M. Gordon and E. J. Gerberg. —p. 123.
*Studies on Imported Malarias: I. Ability of Domestic Mosquitoes to Transmit Vivax Malaria of Foreign Origin. M. D. Young, T. H. Stubbs, J. A. Moore and others.—p. 127.
Use of House Mosquito Proofing as Emergency Malaria Control Measure in the Kentucky Reservoir. C. W. Kruse and F. F. Gartrell. —p. 133.
Educational Activities as Related to Returning Malaria Carrier Problem. W. S. Boyd.—p. 147.

Domestic Mosquitoes and Transmission of Vivax Malaria of Foreign Origin.—Young and his associates say that in the fall of 1943 the Public Health Service in cooperation with the Army established the Imported Malaria Studies Program. The objectives were: 1. To determine the ability of the imported malarias to infect American anophelines and to be transmitted by them. 2. To gather information on the parasitology and other characteristics, and to distinguish, if possible, between strains. 3. To evaluate the findings and suggest their implications on control measures. This report is the first of a series resulting from these studies and includes work accomplished through Sept. 30, 1944. On the basis of the evidence so far, the following conclusions appear to be justified: 1. Plasmodium vivax malaria contracted by soldiers in foreign countries (South Pacific, Mediterranean and South American areas) which relapses after their return to this country is infective to the native malaria vectors, viz., Anopheles quadrimaculatus Say and Anopheles maculipennis freeborni Aitken. 2. These mosquitoes infected by the imported vivax malaria can transmit the disease by biting a susceptible person. 3. Control measures are as necessary for imported malarias as for native malarias. Military personnel relapsing with imported malarias in an area where malaria vectors are present would offer possibilities for transmission to the population similar to a corresponding number of native malaria cases.

Journal of Urology, Baltimore

53:647-752 (May) 1945

Effects of Certain Hormones on Renal Function of Man. A. L. Dean, J. C. Abels and H. C. Taylor.—p. 647.
Occurrence of Sulfide in Renal Calculus. Leona Hudson, Amelia M. Cherkes and K. W. Buchwald.—p. 654.
Mucinous Carcinoma of Urachus Invading Bladder. J. J. Hayes and A. D. Segal.—p. 659.
Neurogenic Vesical Dysfunction: Experimental Study. C. E. Jacobson Jr.—p. 670.
*Treatment of Alkaline Incrustations of Urinary Tract with Solution G. C. C. Herger and H. R. Sauer.—p. 696.
Solution of Incrustations in Urinary Bladder by New Method. E. E. Lins.—p. 702.
Lipids of Prostatic Fluid, Seminal Plasma and Enlarged Prostate Gland of Man. W. W. Scott.—p. 712.
Treatment of Rectourethral and Rectovesical Fistula. S. F. Wilhelm. —p. 719.
Involvement of Genitourinary Tract in Leukemia, with Report of Case of Involvement of Urinary Bladder. C. L. Pentecost and P. Pizzolato. —p. 725.
Diverticula of Urethra in Women: Review of 12 Cases. C. C. Higgins and E. S. Rambousek.—p. 732.
Anesthesia for Urologic Patient: Review of 973 Cases. Mary Karp. —p. 740.

Solution G for Alkaline Incrustations of Urinary Tract.—Herger and Sauer studied the effect of solution G (citric acid, magnesium oxide, sodium carbonate and distilled water) on 41 patients. They selected for treatment patients with persistent alkaline infections of the urinary tract, particularly those in whom a tendency to recurrent or continued formation of incrustations or stones was apparent. A three way Foley-Alcock catheter was placed indwelling, and the solution was administered by means of a drip at a rate of from 40 to 60 drops per minute. Continuous drainage was accomplished by allowing the mixture of urine and solution to escape through the return tube of the catheter. It has been advantageous in suitable cases to elevate the tube draining the return fluid 15 to 30 cm. above the symphysis. Thus tidal drainage and periodic distention of the bladder with a mixture of solution G and urine were accomplished. The patient's fluid intake was held at a level of about 3,000 cc. per day, and the amount of solution G used during twenty-four hours was between 3,000 and 4,000 cc. The results were most impressive in patients with incrusted alkaline cystitis and patients with incrusted radium necrosis. Not only will prolonged employment of solution G prevent recurrent formation of calcareous deposits while it is being administered but also it will exert bactericidal effects by changing the alkaline p_H of the bladder content to a p_H of 4.6 to 4.0. In the majority of cases, one course of treatment lasting from two to four weeks has been sufficient. As a stone dissolving agent the use of solution G is indicated only under certain conditions. It has proved valuable in cases in which formation of kidney stones occurs as a result of infection with urea splitting bacteria. It is possible to dissolve these stones before they become hard or large. If surgical removal of stones from badly infected kidneys is carried out, nephrostomy should be done routinely in order to facilitate postoperative irrigation treatment with solution G. Also in cases of sandlike deposits or multiple stone formation in the kidney pelvis the authors advocate the use of solution G postoperatively to dissolve the remaining stones and to prevent formation of new stones. The indication for use of solution G for the purpose of dissolving bladder stones is a limited one. Since many of these patients require elimination of some form of obstruction, surgical procedures are preferable. The use of solution G should be advocated for patients with alkaline bladder stones who refuse surgery or transurethral manipulations, for patients for whom such procedures are contraindicated and for patients whose bladders are so badly infected that treatment of the infection is desirable before attempts at removal are made.

Kansas Medical Society Journal, Topeka

46:217-252 (July) 1945

Clinical-Pathologic Study of Erythroblastosis. H. C. Clark.—p. 217.
Studies on Oral Administration of Penicillin. H. G. Nelson.—p. 224.

Military Surgeon, Washington, D. C.

96:457-554 (June) 1945. **Partial Index**

Present Status of Sulfonamides. W. W. Hall.—p. 457.
Inspection of Canned and Cured Meat and Meat-Food Products. F. C. Waters.—p. 461.
Eye Replacement by Acrylic Maxillofacial Prosthesis. P. J. Murphey and L. Schlossberg.—p. 469.
Army's Milk Supply and Problems Incident to Procurement and Inspection. C. J. Babcock.—p. 479.
Duodenal Ulcer in Large Army Camp: Incidence and Statistical Analysis. H. B. Loder and S. A. Kornblum.—p. 492.
Psychiatric Studies Based on New Personality Test. A. W. Bortin and I. Brill.—p. 497.
Pilonidal Cysts: Operative Technic. J. S. Brown Jr.—p. 504.
Mucocele of Appendix: Case Report. R. C. Giles.—p. 507.
Intravenous Barbiturates: Aid in Diagnosis and Treatment of Conversion Hysteria and Malingering. D. P. Morris.—p. 509.
Medical Liaison in the China Theater Before and During Salween Campaign. E. Owyang.—p. 513.
*Agranulocytosis Caused by Mapharsen and Treated with Sulfadiazine. H. Tarnower.—p. 516.
Gangrenous Ileocolic Intussusception: Case Report. L. B. Keels.—p. 520.
Simple Method of Establishing Blood Bank on Ships of Fleet. L. D. Star.—p. 522.
*Nodular Intrathoracic Lesions in Coccidioidomycosis. M. Helper and F. B. Watts.—p. 524.
Injection Treatment of Sprains. J. H. Nagler.—p. 528.

Agranulocytosis Caused by Oxophenarsine Hydrochloride and Treated with Sulfadiazine.—Tarnower reports a case which indicates that oxophenarsine hydrochloride (mapharsen) is capable of causing agranulocytosis and severe anemia and as such should be administered with special caution to any one sensitive to an arsenical. Sulfadiazine may be administered in the presence of agranulocytosis. The employment of sulfonamides in the treatment of agranulocytosis with the rationale of combating infection until there is a leukocytic regeneration is worthy of further trial.

Nodular Intrathoracic Lesions in Coccidioidomycosis.—The 3 cases reported by Helper and Watts are significant because of the unusual intrathoracic pathologic changes seen seven to thirteen months after the acute phase of coccidioidomycosis had subsided. These cases have in common chest pain as the presenting symptom, a positive skin test for Coccidioides immitis, a negative tuberculin test and an intrathoracic mass. In 2 cases the mass was intrapulmonary, in the third probably intrapleural. While the primary pulmonary infection in each of these cases has been overcome, it has left a residual intrathoracic focus which still shows clinical activity, manifested by chest pain, many months later. This symptom is severe enough to prevent these men from doing military duty. The authors conclude that nodular intrathoracic lesions may be a late residual finding in patients who have recovered from acute pulmonary coccidioidomycosis. They stress that late encapsulated coccidioidomycosis must be included in the radiologic differential diagnosis of circumscribed intrathoracic soft tissue lesions.

Minnesota Medicine, St. Paul

28:523-608 (July) 1945

Complications in Urinary Tract During Pregnancy. W. F. Braasch and R. D. Mussey.—p. 543.
Placenta Accreta in Duplex Uterus Found at Cesarean Section. J. R. Manley.—p. 547.
*Survey of Leptospirosis (Weil's Disease) in Minnesota. A. B. Stavitsky and R. G. Green.—p. 549.
Acute Appendicitis: Study of Cases Admitted to Minneapolis General Hospital Over Five Year Period. J. V. Farkas.—p. 551.
Pulmonary Metastasis of Carcinoma Diagnosed by Bronchoscopy. W. S. Tinney and J. R. McDonald.—p. 554.
Multiple Malignant Argentaffin (or Carcinoid) Tumors of Small Bowel with Disseminated Metastasis. C. E. Watz.—p. 558.
Tumors of Breast. E. T. Bell.—p. 560.
Parenteral Fluid Therapy. R. F. Schmidt and A. H. Wells.—p. 564.

Leptospirosis (Weil's Disease) in Minnesota.—Stavitsky and Green say that despite the apparent increase in leptospirosis in man and animals throughout the United States no cases have been reported from Minnesota. The authors therefore inquired as to the presence or absence of the etiologic agent of leptospirosis, Leptospira icterohemorrhagiae, in certain groups of the human and animal population in and around Minneapolis and St. Paul. All tests on human material were negative, but in 4 rats evidence of infection with actively virulent leptospiras was obtained by direct dark field observation and animal inoculations of minced rat kidneys. Evidence of past infection of 3 dogs was secured by means of positive agglutination tests of their serums against Leptospira icterohemorrhagiae in significant titers of 1:300, 1:200 and 1:100. Although no evidence of human leptospiral infection has been obtained in this area, human cases might well occur. Only 50 per cent of the cases of Weil's disease present jaundice, while some take the form of a relatively benign meningitis with none of the classic symptoms of leptospirosis other than a positive agglutination test. In the latter type of case ordinary bacteriologic studies usually fail to reveal the presence of the organism, as leptospiras do not grow on ordinary bacteriologic mediums and are not stained by the more commonly used stains.

New England Journal of Medicine, Boston

233:1-24 (July 5) 1945

Surgical Management of Carcinoma of the Midthoracic Esophagus. R. H. Sweet.—p. 1.
Antithrombotic Action of Gelatin. H. Haimovici and J. Fine.—p. 8.
Gynecology: Carcinoma of the Endometrium. J. V. Meigs.—p. 11.
Fibrosarcoma of Lung (Hypertrophic Osteoarthropathy). A. J. Linenthal.—p. 18.
Bleeding Duodenal Ulcers. G. Marks.—p. 22.

233:29-54 (July 12) 1945

History of Middlesex North District Medical Society 1844-1944. A. R. Gardner.—p. 29.
Early Rising After Surgical Operations. J. Ashkins.—p. 33.
Present Status of Antimalarial Drugs. L. E. Napier.—p. 38.
Adenocarcinoma of Lung: Severe Pulmonary Osteoarthropathy. J. Lerman.—p. 44.
Portal Cirrhosis of Liver, with Ruptured Esophageal and Gastric Varices. C. M. Jones.—p. 48.

New York State Journal of Medicine, New York

45:1375-1486 (July 1) 1945

Urology. G. E. Slotkin.—p. 1418.
Public Health, Hygiene and Sanitation. F. E. Coughlin.—p. 1423.
Physical Medicine. W. S. McClellan.—p. 1426.
Dermatology and Syphilology. E. W. Abramowitz.—p. 1429.
Obstetrics. C. J. Marshall.—p. 1432.
Ophthalmology. H. H. Joy.—p. 1434.
History of Medicine. T. W. Clarke.—p. 1436.
Radiology. L. A. Hadley.—p. 1438.
Progress in Study of Experimental Endocarditis. W. J. MacNeal, Anne Blevins, Alice E. Slavkin and Helen Scanlon.—p. 1440.
Toxic Aspects of Digitalis Therapy. W. C. Hueper.—p. 1442.
Interrelationship of Undernutrition, Fatigue and Latent Hepatic Disease in Industrial Worker. A. O. Wilensky.—p. 1447.
Role of Pyruvic Acid in Fatigue. N. Meyer.—p. 1450.
Penicillin Pneumococcic Endocarditis of Infant with Congenital Heart Disease, I. N. Kugelmass.—p. 1460.
Effect of the Blood Sugar on Electroencephalogram. W. Goldfarb.—p. 1460.
Congenital Elevation of Scapulae with Bilateral Omovertebral Bones. R. E. Ingersoll.—p. 1462.

45:1487-1598 (July 15) 1945

Comparative Study of 800 Temperate and Intemperate Inmates of Penal Institution. P. Wenger.—p. 1531.
Appendicitis: Survey of Last 2,000 Consecutive Cases. H. A. D. O'Connor and E. M. Bessie.—p. 1535.
*Smoking and Tuberculosis. H. F. Schwartz.—p. 1539.
Exophthalmic Goiter: Its Conservative Treatment. I. Bram.—p. 1543.
Treatment of Children with Cerebral Palsy. Veronica O'Brien.—p. 1548.
Peroral Endoscopy: Its Aid to Clinical Diagnosis. D. Ide.—p. 1551.
Plastic Surgery on Axilla in Certain Cases of Persistent Bromidrosis. K. Kahn.—p. 1555.
Fifteen Hundred Consecutive Deliveries of Viable Babies at North Country Community Hospital. R. S. Millen.—p. 1559.
Electroshock Therapy in Pregnant Mental Patients. P. Polatin and P. Hoch.—p. 1562.
Unusual Focal Injury to Spinal Cord. G. D. Nammack and S. Hirsch.—p. 1564.
Unusual Electrocardiographic Finding in Myocardial Infarction. H. L. Jaffe, A. M. Master and H. Kalter.—p. 1565.
Oliguria and Renal Calculus Resulting from Administration of Sulfamerazine. H. Mandelbaum and H. J. Amsterdam.—p. 1568.

Smoking and Tuberculosis.—A questionnaire was sent to 50 sanatorium directors. The answers revealed that 13 considered smoking definitely harmful to tuberculous patients, 36 considered excessive smoking harmful and only 1 considered it not harmful. Only 16 per cent had rules which rigidly forbade the practice. Most of the men permitted smoking in certain cases or ignored the fact that the rules were being broken. This attitude is engendered by the fact that it is difficult to discourage patients from a habit of long standing in return for a benefit which is of questionable value. An examination of the more recent literature leads to the conclusion that since smoking is harmful even to normal persons it is bound to have a deleterious effect on the respiratory tract of the tuberculous. It is felt that the best approach to the problem would be a definite rule forbidding smoking, with frequent explanations about the dangers inherent in the practice.

Ohio State Medical Journal, Columbus

41:613-684 (July) 1945

Low Back Pain Routine. W. R. Hochwalt, A. E. Culmer Jr. and S. C. Rogers.—p. 613.
Management of Patients with Prostatic Hypertrophy: Review of 214 Cases. C. C. Higgins.—p. 618.
Second Report of Prophylaxis of Post-Tonsillectomy Granulation Oozing. C. A. Campbell.—p. 621.
Erythroblastic Anemia—Mediterranean Disease in an Adult: Report of an Unusual Case. J. T. Read.—p. 623.
Clinical Observations on Use of Cotton as Suture Material. W. P. Kanne and W. E. Smith.—p. 625.
Allergic Manifestations to Sulfamerazine, with 2 Case Reports of Anuria in Children. A. Dintenfass.—p. 628.
Capillary Fragility and Allied Tests. J. D. Walters.—p. 632.
Thrombosis of Superior Mesenteric Artery. M. E. Green, D. L. Eyler and J. C. Weeter.—p. 634.

Public Health Reports, Washington, D. C.

60:753-788 (July 6) 1945

*Observations on Use of DDT for Control of Anopheles Quadrimaculatus. R. L. Metcalf, A. D. Hess, G. E. Smith, G. M. Jeffery and G. W. Ludwig.—p. 753.

Use of DDT for the Control of Anopheles Quadrimaculatus.—Laboratory and field studies were conducted in the Tennessee Valley during 1943 and 1944 to provide information on the use of DDT as a residual house spray for the control of

the adult Anopheles quadrimaculatus and on its effectiveness as an anopheline larvicide and adulticide when applied as a dust, a spray or a thermal aerosol. The results of these investigations are summarized by Metcalf and his associates. Laboratory observations of wall board sprayed at rates of 40,200 and 1,000 mg. of DDT per square foot showed that there was no significant difference in the initial toxicity to adult A. quadrimaculatus at the different dosages, the percentage of mortality being determined primarily by the period of contact. Residual toxicity, however, was dependent on the rate of application, though not directly proportional to it; sufficient residual toxicity to produce 100 per cent mortality to adults exposed for sixty minutes persisted for four to sixteen weeks, depending on the dosage. Barns treated with DDT at a rate of about 200 mg. of DDT per square foot remained almost entirely free from flies and mosquitoes for at least eleven weeks. Unoccupied houses treated with DDT at a rate of about 250 mg. of DDT per square foot remained toxic to A. quadrimaculatus adults for at least fifteen weeks; occupied dwellings lost their toxicity more rapidly than unoccupied houses but remained toxic to A. quadrimaculatus for at least three months. Exposure to DDT surfaces completely reversed the normal light reactions of the mosquitoes, making them positively phototropic. Solutions of 2.5 per cent DDT in kerosene gave effective control of anopheline larvae when applied by boat oiling units at rates of approximately 1/10 pound of DDT per acre, thereby making possible a reduction of about 98 per cent in the amount of kerosene normally used. DDT had to be diluted with 95 per cent of soapstone before a satisfactory airplane dusting mixture was obtained. With this mixture 90 per cent control of A. quadrimaculatus larvae was obtained over 200 foot swaths at actual treatment rates as low as 1/20 pound per acre. Certain polymethylnaphthalenes (Velsicols) having a high solubility for DDT and a high boiling point were found to be ideal solvents for making liquid solutions of DDT to be applied by airplane. DDT dusts and thermal aerosols gave no evidence of injury to fish or other aquatic organisms when applied by airplane at rates of 1/10 pound of DDT per acre. Five per cent solutions of DDT in kerosene applied at rates of about 1/4 pound of DDT per acre were quite destructive to aquatic insects living in close contact with the water surface, particularly Hemiptera and Coleoptera.

Review of Gastroenterology, New York

12:175-240 (May-June) 1945

*Two New Tests of Gallbladder Disease for Clinical and Research Use. L. M. Morrison and W. A. Swalm.—p. 175.
*Cholinesterase and Its Correlation with Bowel Movement and Liver Function. R. Bauer.—p. 185.
War Zone Diseases Which Confront Civilian Physician. H. A. Rafsky.—p. 193.
Discovery of Roentgen Rays: Wilhelm Konrad Röntgen, March 27, 1845-February 10, 1923. H. I. Goldstein.—p. 201.

Tests of Gallbladder Disease.—Morrison and Swalm present two new tests for the detection of active gallbladder disease. The first is a surface tension method and the second a specific gravity method. The tests are based on the concentrating function of the gallbladder studied in over 5,000 bile specimens. They are often valuable laboratory adjuncts or alternatives to the cholecystogram in deciding for or against gallbladder surgery. For research purposes the surface tension test can be used to determine the concentration of bile salts in the gallbladder bile from the duodenal drainage bile, by the surface tension or stalagmometric method. The normal gallbladder concentrates between 1,000 and 2,000 mg. of bile salts per hundred cubic centimeters of bile in the gallbladder or the B fraction of the nonsurgical biliary drainage bile. Pathologic gallbladders concentrate less than 1,000 mg. of bile salts per hundred cubic centimeters in the gallbladder or B fraction of the nonsurgical biliary drainage bile. When the gallbladder and liver biles are too mixed to make a separate gallbladder estimation, the pathologic gallbladder can often be detected by its inability to raise the concentration of the bile salts in the combined bile to 300 mg. or more above that in the liver bile alone. The estimate from the gallbladder bile alone is the most accurate and hence preferable. In the presence of functional gallbladder stasis or dyskinesia, when the gallbladder mucosa is still apparently healthy, the bile salts in the gallbladder rise abnormally high to between 2,000 and 3,000 mg. per hundred cubic centimeters of bile. For practical clinical purposes, the specific gravity test consists in determining the density of the B or gallbladder bile in the nonsurgical biliary drainage, and comparing it with the C or liver bile. The specific gravity of normal gallbladder bile is from 0.005 to 0.050 greater than that of the liver bile. The average specific gravity of the normal B or gallbladder bile in a series of 100 cases with proved normal gallbladders was 0.011 greater than the specific gravity of the C or liver bile in the duodenal drainage. The specific gravity of the B bile from the diseased gallbladder is less than the specific gravity of the liver bile, or equals it, or is not more than 0.004 greater than the specific gravity of the liver C bile.

Correlation of Cholinesterase with Bowel Movement and Liver Function.—The substance released by the vagus following electric stimulation is acetylcholine. Cholinesterase was detected as the ferment which splits acetylcholine and which is present in serum and erythrocytes. The quantitative determination of this ferment, particularly by titration, involves many difficulties. Bauer stresses the importance of the p_H and of the temperature. He used the method indicated by Butt and his co-workers. Twenty-seven of 208 cases gave high or low readings. Low values have invariably been found in liver diseases, anemia and debility; high values in endocrine disturbances, especially hyperthyroidism. High readings were also obtained in constipation, nephrosis and endocrine disorders, and low readings in anemia, liver diseases, cachexia and septicemia. Control tests with Hanger's cephalin-cholesterol and R. Bauer's magnesium chloride tests showed that positive flocculation results are not always accompanied by low serum esterase values. A large part of the enzymic action is contained in the red cells. Therefore the ratio of the red cells to serum has to be considered especially with liver diseases. The situation seems to be even more complicated since Mendel and Rodney in 1943 split the ferment into pseudocholinesterase and cholinesterase. The current clinical investigations have been made with the unspecific ferment, the so-called pseudocholinesterase. Current clinical investigations do not give a clear insight into the splitting of acetylcholine.

Southern Medical Journal, Birmingham, Ala.

38:443-504 (July) 1945

Clinical Experiences with Thiouracil. R. O. Muether, D. L. Sexton, W. Macdonald and J. T. Von Brueggen.—p. 443.
Incidence of Esophageal Disease in Negroes. P. P. Vinson.—p. 452.
Complications of Peptic Ulcer. W. B. Marbury and M. L. Goldman.—p. 453.
Postwar Tropical Disease Problems in the United States. F. A. Butler and J. J. Sapero.—p. 459.
Use and Abuse of Sulfonamides in Treatment of Skin Diseases. N. Tobias.—p. 467.
*Talcum as an Operating Room Hazard. M. G. Seelig.—p. 470.
Anal Fistula. B. F. Hardin.—p. 472.
Cryptorchism. G. R. Livermore.—p. 477.
Radiation Therapy in Uterine Fibroid. J. D. Peake.—p. 480.
Ectopic Pregnancy. R. Torpin.—p. 485.
Closing Tympanic Membrane Perforations. S. L. Fox.—p. 492.
Transportation of Gonococcus Specimen. Nell Hirschberg.—p. 493.

Talcum as an Operating Room Hazard.—Seelig says that if a surgeon dons a pair of gloves that have been powdered with talcum, rinses them thoroughly and then allows them to dry a few minutes, they will still show a coating of talcum. From 50 to 100 mg. of talcum accumulates in the finger tips, and an accidental rip in a finger causes spillage. The process of powdering produces a deposition of powder on materials and instruments that are later used in the operation. Biopsy specimens from omental tissue of patients who are subjected to a second laparotomy frequently disclose talc crystals and foreign body reactions. These reactions manifest themselves as granulomas and as dense adhesions, particularly in the cranial and abdominal cavities. Microscopically the picture resembles that of tuberculosis, and clinically it not infrequently imposes itself as malignant disease. Investigations to find a substitute for the treacherous talcum powder disclosed that potassium bitartrate (cream of tartar) is suitable, and more recently a special starch powder has been developed.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Annals of Rheumatic Diseases, London

4:51-70 (March) 1945

Gout and Its Effect on Cardiovascular System. G. L. Steinberg.—p. 51.
Nerve Symptoms in Vertebral Rheumatism. C. W. Buckley.—p. 54.
Blood Plasma Fibrinogen in Rheumatic and Nonrheumatic Conditions. A. J. Mester.—p. 57.
Rheumatic Disease in Middle East. G. D. Kersley.—p. 60.
"A. C. B. Serum" of Professor Bogomolets in Treatment of Rheumatism. F. Bach.—p. 62.
Pan American League for Study and Control of Rheumatic Diseases. L. T. Swaim.—p. 69.

British Journal of Surgery, London

32:441-550 (April) 1945

Internal Inguinal Ring. W. J. Lytle.—p. 441.
Some Unusual Thoracic Tumors. N. R. Barrett and W. G. Barnard. —p. 447.
Complications of Acquired Diverticulosis of Jejunum and Ileum. R. M. Walker.—p. 457.
Conservation of Metacarpus by Skin and Bone Grafting in 3 Patients. P. B. Moroney.—p. 464.
Osteomyelitis of Clavicle. Tina Gray.—p. 466.
Obstructive Appendicitis. W. H. Bowen.—p. 468.
*Plasmocytoma of Bone. W. Tennent.—p. 471.
Operative Replacement of Mammary Prominence. H. Gillies.—p. 477.
Malignant Tumors of Small Intestine: Review of Literature and Report of 21 Cases. K. Fraser.—p. 479.
Spontaneous Rupture of Hydronephrosis. R. Reid and W. C. Menzies. —p. 491.
Abnormality of Calcaneus as Cause of Painful Heel: Its Diagnosis and Operative Treatment. A. Fowler and J. F. Philip.—p. 494.
Inguinal Hernia: New Operation, with Special Application to Services. W. V. Beach.—p. 499.
Ulcer of Second Part of Duodenum. P. T. Crymble.—p. 500.
Case of Pseudarthrosis Following Fractures of Lumbar Transverse Processes. G. Hyman.—p. 503.
Actinomycosis from Punch Injuries, with Report of Case Affecting Metacarpal Bone. H. J. Burrows.—p. 506.
Suture of Laceration of Inferior Vena Cava Due to Bomb Splinter. H. A. Kidd.—p. 508.
Volvulus of Small Intestine Due to Meckel's Diverticulum. R. Smith. —p. 510.
Case of Regional Enteritis in Childhood. D. Ebrill.—p. 512.
*Delayed Paraplegia Following Fractures of Vertebrae. L. Rogers. —p. 514.
*Further Observations of Clinical Value of Growth Promoting Substance in Wound Treatment. H. Werner.—p. 518.
Fracture Dislocation of Occipital Bone. S. Taylor.—p. 522.
Ureteric Calculus of Unusual Size. G. Marangos and G. E. Porter. —p. 524.

Plasmocytoma of Bone.—Tennent presents evidence that plasmocytoma of bone forms a distinct clinical picture of a solitary intramedullary neoplasm, remaining strictly localized for several years, but if untreated developing into the fatal condition of multiple myelomatosis. A case conforming to this description is reported in which the primary plasmocytoma remained localized in the right ilium for four and one-half years, with subsequent development of multiple myelomatosis and death five years after the first symptoms. This case illustrates the natural history of the disease in the absence of treatment. Analysis of the 50 recorded cases revealed that 35 involved men and 15 women. The distribution was pelvis 16, femur 12, humerus 9, vertebrae 6, skull 5, tibia 1, clavicle 1. Presenting symptoms were either pain, pathologic fracture or local swelling. When the tumor occurred in a long bone the tendency to pathologic fracture was high. There is difference of opinion regarding the origin and nature of these tumors, but the weight of evidence appears to be in favor of the tumor arising as a variant of the reticulum cell. Treatment consisted in amputation, curettage, high voltage x-rays or radium. Nothing is to be learned as to the relative merits of these methods, owing to the lack of adequate follow-up. The prognosis is less favorable than in osteoclastoma and considerably more favorable than in osteogenic sarcoma.

Delayed Paraplegia Following Fractures of Vertebrae.—Rogers says that when paraplegia complicates a vertebral fracture it is usually a concomitant condition produced at once. Rarely is the onset of paraplegia delayed. He cites cases in which there was an interval between the injury to the back and the onset of paraplegia. A seaman aged 22 was blown up by a torpedo explosion, walked to the ship's side, clambered overboard, swam away from the ship and then became paraplegic. A member of the air force injured in a spitfire crash experienced pain between the shoulders but no other symptoms. Paraplegia developed in forty-eight hours. Another patient had a cycling accident. He walked a mile, then sat down because of pain in the back and was unable to rise because of paraplegia. A girl of 17 was in a bicycle collision with a car. She picked herself up, was taken by car to the doctor's house and walked inside. She then developed numbness and paralysis. In 2 of the described cases the paraplegia was transient, resolving completely in a few days' time. In the other 2 cases it was persistent, and exploration was carried out with improvement in both following the removal of bony encroachment on the spinal canal. In the transient cases delayed paraplegia is probably due either to subpial hemorrhage or to edema, which, when fully established at a varying interval after the injury, is sufficient to impair conduction in the cord. With absorption of the effusion in some twenty-four to forty-eight hours or even longer, conduction is once more restored. Persistent delayed paraplegia is an indication for operation and removal of the bone block produced by displacement of the vertebral fragments.

Growth Promoting Substance in Wound Treatment.—Werner says that since a previous report by Kerr and himself on the clinical value of growth promoting substance a further 44 cases have been treated with heart extract powder. All patients had shown indolence and intractability toward orthodox treatment. The use of tissue extract was confined to wounds which had been treated for a period of at least six weeks unsuccessfully. The majority of the lesions responded favorably to the treatment. Three ulcers and one chronic wound can be classified as failures. The same three groups as previously described were treated: (1) ulcers, (2) wounds by projectiles, (3) burns. Further evidence has been collected about the general action of heart extract powder. It has been applied to one of several coexistent wounds with the result that healing in the treated wound was accompanied by healing in the others. Owing to unforeseen circumstances the treatment with heart extract powder had to be discontinued for a fortnight. The treated wounds responded to this interruption in two ways: In the smaller group healing proceeded satisfactorily, whereas in the major group the condition retrogressed. After the treatment was renewed, the patients who had larger lesions responded to the first application of heart extract powder with protein shock. After several applications this reaction subsided. The fact can be explained in the way that the interruption led to an accumulation of antibodies, so that the individual treated responded with a form of anaphylactic shock. The results in chronic burns justify the trial of heart extract powder on fresh burns.

British Medical Journal, London

1:759-794 (June 2) 1945

Clinical Features of Poliomyelitis Epidemic in Malta, 1942-1943. T. Agius, A. E. Bartolo, C. Coleiro and H. J. Seddon.—p. 759.
*Acute Anterior Poliomyelitis Among Service Personnel in Malta: Account of an Epidemic. H. G. G. Bernstein, J. M. P. Clark and R. E. Tunbridge.—p. 763.
*Erythrocyte Sedimentation Rate in Infective Hepatitis. J. A. R. Miles. —p. 767.
Necrosis of Liver and Bilateral Massive Suprarenal Hemorrhage in Puerperium. G. H. Dodds.—p. 769.
*Mumps Meningoencephalitis and Orchitis. J. P. A. Halcrow and I. Wang.—p. 770.
Diet for Malnourished Prisoners of War. S. Kenny.—p. 777.
Impaired Workers in Industry: American Experience and Successes. H. Levy.—p. 778.

Acute Anterior Poliomyelitis in Malta.—Bernstein and his associates describe clinical and pathologic aspects and treatment of 57 adult patients with anterior poliomyelitis seen among service personnel during the Malta epidemic of 1942-1943. There were eleven deaths. In 2 cases no paralysis was noted. In 26 cases there was no serious final disability. In 14 cases the cranial nerves were involved; in 16 cases there was respiratory paralysis; all deaths resulted from respiratory paralysis despite the use of a mechanical respirator of the Drinker cabinet pattern. Convalescent serum and sulfadiazine were used in a small number of cases without apparent benefit. The onset of the paralysis was often delayed and in a few instances was not apparent until the fifth week.

Erythrocyte Sedimentation Rate in Infective Hepatitis.—Miles followed the erythrocyte sedimentation rate in 80 patients with infective hepatitis throughout their hospital stay. In 40 of the 80 cases the rate was raised above 10 mm. at some stage of the disease, and it was noticed that in these cases the erythrocyte sedimentation rate was low in the acute stage except in a few very mild cases and then became raised as recovery occurred. Estimates revealed that in this series there was a rise in the erythrocyte sedimentation rate as the serum bilirubin fell. There was a strong negative correlation between the height of the erythrocyte sedimentation rate and the serum bilirubin. Evidence has been produced to suggest that an increase in bile salts might cause an inhibition of the erythrocyte sedimentation rate in the acute phase of the disease.

Mumps Meningoencephalitis and Orchitis.—Halcrow and Wang present the case of a soldier aged 26 in whom an almost latent parotitis was followed three days later by a fairly severe orchitis, thirty-six hours after which meningoencephalitis manifested itself. Recovery was complete and rapid. Although the patient had been given sulfadiazine, the authors do not think that it influenced the course of the disease.

Journal of Laryngology and Otology, London

59:374-404 (Oct.) 1944

Experiences of Bloodless Treatment for Recurrens Paralysis. E. Froeschels.—p. 347.

Contributions to Functional Pathology of Ear: III. Clinical Bearing of Differentiation Between Sensitivity and Efficiency of Ear, with Special Reference to Vestibular Tonus. F. Kobrak.—p. 359.

Disease of Cervical Spine in Laryngologic Practice. M. S. Harrison. —p. 391.

Proceedings of Royal Society of Medicine, London

38:309-398 (May) 1945

International Sanitary Convention of 1944. P. G. Stock.—p. 309.

Subjective Psychologic Responses of Patients Undergoing Physical Treatment in Mental Disorders: Attempt at Clinical Evaluation. J. Frank. —p. 317.

Vitamin A and the Skin. H. S. Stannus.—p. 337.

Bone Tumors and Their Radiologic Implications. J. L. A. Grout. —p. 345.

Steatorrhea Due to Lymphatic Obstruction. R. S. B. Pearson.—p. 385.

Chinese Medical Journal, Washington, D. C.

62:221-304 (July-Sept.) 1944

Typhus Fever—Clinical Study of 94 Cases. C. C. Wu and C. Y. Chi. —p. 221.

Weil-Felix Reaction of Men and Rats in Kweiyang. H. M. Jettmar and S. Li.—p. 227.

Blood and Urinary Nicotinic Acid in Normal Chinese, Pellagra and Various Pathologic Conditions. H. I. Chu, P. T. Kuo and K. P. Chang. —p. 231.

Urinary Excretion of Nicotinic Acid Among Normal Chinese, Pellagrins and Other Patients. H. C. Hou and M. Y. Dju.—p. 246.

Studies on Susceptibility of Shanghai Mosquitoes to Experimental Infection with Microfilaria Malayi Brug: VII. Culex Fuscanus Weidemann. S. M. K. Hu.—p. 255.

Fibrinolytic Activity of Hemolytic Streptococci in Relation to Their Serologic Grouping. C. J. Wu.—p. 260.

Germicidal Power of Garlic. C. L. Chu and S. E. Pai.—p. 267.

*Lobar Pneumonia in Children, with Special Reference to Treatment: Clinical Analysis of 105 Cases. T. F. Su and B. C. Lee.—p. 270.

Localized Leishmaniasis of Lymph Glands. H. L. Chung, with a note by V. T. Lieu.—p. 284.

Treatment of Lobar Pneumonia in Children.—According to Su and Lee, lobar pneumonia is common among Shanghai children. The 105 cases reviewed occurred among 2,745 hospital admissions between February 1938 and March 1941, giving an incidence of 3.83 per cent. There was a seasonal increase in December, and the highest peak was reached in February and March. Forty of the children were less than 2 years old. Seventy per cent of the patients were boys. Thirteen of the 105 patients died, 6 of them within twenty-four hours of hospitalization. Studies were made on 56 patients who were treated with sulfonamide derivatives and 39 who received no chemotherapy. Sulfapyridine was used in 40 cases and was found to shorten the fever period, but the incidence of toxic reaction was fairly high. Sulfathiazole showed a good result in 5 cases so treated, and the incidence of its toxic reactions was less frequent.

Archives des Maladies Professionnelles, Paris

6:61-124 (No. 3) 1944-1945

Question of Pneumonoconiosis from Lignite. A. Policard, A. Hanaut and Leroy.—p. 61.

Results of Roentgenologic Investigations on Miners in the Loire Basin. E. Martin and L. Roche.—p. 67.

Tuberculosis and Occupations. J. Troisier, G. Poix and H. Bour.—p. 70.

Draft for Radiologic Terminology for Classification of Silicotic Pneumonoconiosis. M. Eck and A. Hanaut.—p. 74.

Fatigue and Wear in Man. Gautrelet.—p. 79.

Physiopathologic Bases of Therapy of Lead Poisoning. L. Dérobert. —p. 84.

*Glass Fiber: Pathology and Hygiene of Workshops. J. Champeix.—p. 91.

Hygiene of Workshops Handling Glass Fiber.—Champeix says that to the long list of insulating materials there has been added in France during the last ten years a heat resisting substance of a glass fiber base. Whereas formerly heat insulators were mostly of an asbestos base, glass fiber is used now more and more. Manifestations of mechanical irritation were observed. They consisted of cutaneous erythema with pruritus, blepharitis and rhinopharyngeal irritation. Neither clinical nor roentgenologic observation disclosed pulmonary changes, but the glass fiber had been used by these workers for only six months and, even if danger of silicosis existed, several years would have to elapse for pulmonary changes to be roentgenologically perceptible. The weaving of glass fiber is not so much harmful as annoying to the workers, because of the almost incessant pruritus caused by the glass dust. He recommends a number of protective measures, such as catching the glass dust at the level of the loom so as to avoid its dissemination, good ventilation of the work shop, individual dressing rooms so that every worker can completely change his clothing before and after work because the dust of glass fiber passes through ordinary clothing and the wearing of tightly woven work clothing so as to avoid as much as possible the penetration of the glass fiber. Shower baths should be provided for the workers at the end of their working time so that they can clean their body from the glass fibers that have penetrated the clothing. The parts of the body not protected by clothing should be coated with soothing ointments, before and after work, to attenuate if not prevent the pruritus. Eating in the workshop should be prohibited. When workmen are engaged for working with glass fiber they should be subjected to a medical examination so as to avoid those with cutaneous and pulmonary lesions. Those working with glass fiber should be periodically examined.

Nordisk Medicin, Stockholm

24:2121-2160 (Dec. 1) 1944

*Minimum Amount of Liver Extract in Maintenance Treatment of Pernicious Anemia and Complications Due to Treatment. J. Waldenström. —p. 2121.

Hospitalstidende

Brachialgia and Cervical Spondylosis. M. Lund.—p. 2127.

Protracted Treatment with Diethylstilbestrol. K. Biering-Sørensen. —p. 2131.

Finska läkaresällskapets handlingar

White Blood Picture During War: Preliminary Report. G. F. Saltzman. —p. 2133.

Hygiea

Tissue Changes in Not Viable Infants After So-Called Shock Doses of Vitamin D. T. Johnsson and Å. Wilton.—p. 2139.

Two Cases of Bronchosclerosis (So-Called Valvular Stenosis). A. Gunther. —p. 2146.

Liver Extract in Pernicious Anemia.—Waldenström says that treatment with injections of liver extract can be carried out on a large scale with excellent results at a minimum cost. Of his present 160 patients with pernicious anemia 103 have been treated for at least four years with an average number of 5.3 injections annually for men and 5.1 for women with an annual cost varying from 18 to 42 Swedish kronor. The average number of erythrocytes maintained was 4.1 million for men, 4 million for women. Five patients were given liver preparations orally because of severe reactions to several brands of liver extract. Reactions which occurred in 17 of the 160 cases were usually overcome by injection of a different preparation.

Book Notices

Clinical Traumatic Surgery. By John J. Moorhead, B.S., M.D., D.Sc. Cloth. Price, $10. Pp. 747, with 500 illustrations. Philadelphia & London: W. B. Saunders Company, 1945.

In his book the author has summed up his vast experience in the field of occupational accidents as the medical director of the New York Transit System. His participation in World War I and the professional care of the victims of the memorable Pearl Harbor attack entitle him also to speak authoritatively on war injuries. Long teaching experience helped him to avoid confusing lengthy discussions and to recommend therapeutic measures characterized by safety and simplicity. The subject is discussed in a simple, concise and lucid manner.

Special chapters cover regional traumatology, such as treatment of the wounds of the hand and injuries of the head, chest and abdomen. As could be expected, considerable space is given to the treatment of fractures. Special sections cover the medicolegal aspect of traumatic surgery, compensation problems and allied subjects. Traumatic neuroses are discussed in a separate chapter. The text is profusely illustrated with adequate drawings and reproductions.

As the author states in the preface, the average reader seeks the opinion of the writer and therefore bibliographic references have been omitted.

One may not share the author's choice of "I. S. Solution," made up of tincture of iodine and sterile saline solution for the treatment of infected wounds. "Intraclavicular dislocations of shoulder" (p. 309, fig. 143) is bad terminology because the prefix "intra" means "within" and not "median to"; obviously the dislocated head of the humerus cannot be found within the clavicle. The author speaks of Dupuytren's contractions; the term "contracture" is commonly used because it implies that the condition is permanent, while "contraction" indicates a condition of short duration. The heading "Fractions of the Spine" (p. 392) is evidently a typographic error. On page 474, eighth line from the top, the author recommends flexion and adduction of the wrist in order to reduce Colles's fracture. However, ulnar deviation is called abduction and not adduction.

Such minor errors do not detract from the value of the book, which represents a veritable mine of information valuable to a specialist as well as to a general practitioner dealing with injury cases. It is amazing that such an enormous amount of material could be covered in one volume.

Fundamentals of Pharmacology. By Clinton H. Thienes, M.D., Ph.D., Professor and Head of the Department of Pharmacology, School of Medicine, University of Southern California, Los Angeles, Calif. Medical Students Series. Cloth. Price, $5.75. Pp. 497, with 36 illustrations. New York & London: Paul B. Hoeber, Inc., 1945.

To write a concise and comprehensive textbook on the fundamentals of pharmacology which will meet the needs of both students and practitioners and at the same time stimulate the interest of investigators is not an easy task. Dr. Thienes has written a book to meet these requirements. The book is divided into twelve sections, beginning with the systematically acting drugs the effects of which are better understood. Central nervous stimulants and depressants, drugs acting on the peripheral nervous system, drugs acting on the muscles and diuretics occupy the first half of the book. This is followed by antiparasitic drugs, hormones, minerals, tissue extracts and vitamins. Expectorants, emetics and cathartics are included in the section on drugs used because of local action on body surfaces. Chemical diagnostic agents and actions of drugs on cells are treated in two separate sections. Pharmacy and prescription writing form the last section of the book. The chapters on anesthetics and actions of drugs on cells are well written. The discussion on cellular structure and metabolism in the light of recent knowledge of enzyme systems and the discussion on quantitative pharmacology in relationships between drugs and cells and in terms of biologic variation are not usually given in general textbooks on pharmacology. In chapters on sympathomimetic and parasympathomimetic drugs there is no mention of the classification of these autonomic drugs based on adrenergic and cholinergic innervations as advocated by recent investigators. Each drug is presented uniformly throughout the text in the following sequence: sources, chemical nature, preparations, dose, absorption, distribution, fate, excretion, pharmacodynamic effects, toxicology and therapeutic uses. A few important references are given at the end of each chapter.

The book is clearly written and up to date. Some of the recent medicinal agents included in the text are propadrine and other synthetic sympathomimetic drugs, dicumarol and penicillin. The revival of interest in curare and veratrine as therapeutic agents is mentioned. Some of the features that will appeal to medical students are the brief introduction at the beginning of each section, the uniform procedure in the exposition of each drug and the differential analyses of drug actions. The author's emphasis on rational therapy and his discussion of empirical medicine are of special value to practitioners. His critical discussion of controversial topics is another good feature. The text serves well to introduce students to the essentials of pharmacology and to lead them to more comprehensive treatises for details. Practitioners and others will be benefited from it for a quick review of the subject and for a glimpse of the recent advances in the field of pharmacology.

Temas de cirugía de urgencia. Tomo I. Por P. Larghero Ybarz, profesor de patología quirúrgica, cirujano de urgencia de los Hospitales Maciel y Pasteur. Laboratorio de la Cátedra de patología quirúrgica (primer curso), Facultad de medicina de la Universidad de la R. O. del Uruguay. Paper. Pp. 324, with illustrations. Montevideo: Libreros Editores: A Monteverde y Cía "Palacio del Libro," 1944.

The author, in writing this book on first aid, has used to good purpose the experience obtained as surgeon for a number of years in two Montevideo hospitals. It is not, however, a general handbook on the subject but an excellent and occasionally overlong review of some of the most difficult problems he has faced, with representative case reports, tables of results and some fine illustrations. The subjects discussed are gastroduodenal hemorrhages, abdominal wounds, water balance in serious cranial trauma, bronchopulmonary complications in emergency operations, diagnosis of acute appendicitis, peritonitis in typhoid and suppurative mesenteric adenitis. The pathologic picture is invariably emphasized but also related to the clinical and other data.

An Introduction to Medical Science. By William Boyd, M.D., M.R.C.P., F.R.C.P., Professor of Pathology and Bacteriology in the University of Toronto, Toronto, Canada. Third edition. Cloth. Price, $3.50. Pp. 366, with 126 illustrations. Philadelphia: Lea & Febiger, 1945.

This book is designed for nurses at the beginning of their professional careers. It aims to be a general introduction to the study of disease. The first portion of the book deals with general principles, including a chapter on the living body and one on the nature and cause of disease. The second portion deals with the organs and their diseases, namely diseases of the heart, diseases of the lungs, diseases of the urinary system and the like. The final chapter is on practical applications—the prevention of disease, the principles of the treatment, the nurses of the laboratory. The author is a well known pathologist, and the book should be extremely useful for the purpose for which it is intended.

Los grandes síntomas y síndromes: Síntesis de terapéutica clínica. Por Ambrosio Nijensohn. Paper. Pp. 366. Buenos Aires: "El Ateneo," 1944.

An effort has been made throughout this monograph to live up to its subtitle of synthesis of clinical therapeutics and furnish in a condensed form the accepted treatment for the different conditions described. After a short sketch of the situation, the proper care is prescribed. The real novelty is that the measures advised are based on the most striking symptom or syndrome facing the physician when he first sees the patient. This by itself limits the field embraced. The different conditions are grouped as gastrointestinal, respiratory, spleen, glands, nerves, skin and general. All are discussed sensibly and clearly, based on common sense, experience and knowledge.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

TREATMENT OF HERNIATED INTERVERTEBRAL DISK

To the Editor:—**Is there a definite indication for operation in herniated intervertebral disk or does conservative treatment really cure the condition? The concert of present day opinion on the subject shows the most dissonant chords. There are those to whom any sore back with sciatica is a herniated intervertebral disk, and there are those who take pains in reaching such a diagnosis. In the latter group belong Philip Lewin (Backache and Sciatic Neuritis, Philadelphia, Lea & Febiger, 1943), Bernard I. Comroe (Arthritis and Allied Conditions, ed. 3, Philadelphia, Lea & Febiger, 1945), J. Jay Keegan (The Journal, Dec. 2, 1944, p. 868) and John J. Moorhead (*S. Clin. North America* 24: 467 [April] 1944). These authors agree that several diagnostic procedures and signs will indicate a herniated intervertebral disk, but not one of them is sufficiently sure in his diagnosis to permit operation. They recommend months of conservative treatment: strapping, plaster, heat, massage and traction. If the patient is not improved after months of conservative treatment, an operation is recommended. It does not seem very scientific and efficient to exhaust a patient's material means, time and patience with procedures of uncertain effect and then, if necessary, operate on him. It should be possible to determine the 10 per cent who are not going to be improved by conservative treatment at the first examination. It does not seem very logical that a once ruptured intervertebral disk should be completely cured by conservative measures. No observations have been published on the later fate of conservatively treated ruptured disks. I wonder if the patient's life will not be marked by terror and a steady caution in fear of recurrence, and thereby invalidity. The reason given for such overconservatism is that the results of some surgeons are not always good. If we point to the older series of Love and Walsh with its splendid results, then we may come to the conclusion that perhaps some operative minded neurosurgeons do not differentiate strictly enough between a herniated disk and Steindler's posterior division syndrome, and between a disk, a local fibrositis and plain hysteria. If the diagnostic zeal of the conservative group could be followed by prompt operation, and if the operative zeal of the surgical minded group could be supplemented by more careful selection of cases and accurate differential diagnosis, the patient might be better served.**

George Vash, M.D., Philippi, W. Va.

ANSWER.—Whether one should promptly resort to surgery in treating a patient diagnosed as having a protruded intervertebral disk or whether the treatment should be conservative with rest, traction and heat is a question with many angles. The clearcut cases of protruded intervertebral disk which warrant surgery are fairly typical. The patient is usually a man from 20 to 40 years of age, with a history of sudden onset of backache, usually incident to a strain or fall. There is commonly associated sciatic pain radiating down one leg accompanied by a tilt of the body usually away from the affected side and a prominence of the iliac crest on the affected side —a condition spoken of as sciatic scoliosis. If, in addition, there are neurologic findings such as a diminished or absent achilles tendon jerk and anesthesia over a nerve root distribution, the diagnosis is pretty certain. If, with the symptoms mentioned, there is also a positive spinogram, there is no reason why surgery should not be undertaken even though there has been no previous attack. Although some surgeons say that a spinogram is not necessary, it is better that one be made in each case because spinal cord tumors can and do exist, and the use of such a valuable aid as a spinogram should not be neglected to assist in the differential diagnosis. Such conditions in the past were thought to be due to sacroiliac arthritis and were treated as such. Patients often had recurrences over many years, and too often atrophy of the leg and even some paralysis were residual. Many patients who have protruded intervertebral disks involve compensation; that often casts a shadow over recovery. In this type of surgery it is much to be desired that the patient understand the situation and accept the operation without any pressure from the surgeon.

SLIPPING AND LOCKING OF JOINTS

To the Editor:—**A woman aged 51 has joints that tend to slip and lock. She has several in the spine, in the fingers and in the knees. When the joints lock there is extreme pain. The patient had a fibroid tumor, which was successfully removed. All bodily functions are normal and she is perfectly healthy otherwise.**

M.D., Illinois.

ANSWER.—Without a more detailed history and record of more complete physical findings, it is possible only to hazard a few opinions with regard to diagnosis or treatment. A history of slipping and locking in the fingers suggests tendonitis. The classic snapping finger is usually misunderstood by those who have not seen a number of these and is thought to be due to subluxation with locking in the joints. Tendonitis, which produces this condition, may involve only one or a number of digits. Subluxation of multiple joints would be extremely rare. A sensation of slipping followed by locking in the knee is most often the result of partial to complete dislocation of the patella. Somewhat similar symptoms may be produced by internal derangement of the knee due to the presence of osteocartilaginous loose bodies, hypermobile semilunar cartilages or actually torn and displaced semilunar cartilages. Recurrent subluxation or dislocations within the spine occur only in the posterior articular facets. The weight bearing vertebral bodies can be displaced one from the other only as a result of extreme violence or following separation of the isthmus, creating a spondylolisthesis. When such dislocations do occur they can rarely be replaced. Abnormal ranges of motion between the joint surfaces of the posterior articular facets due to over-relaxed joint capsules or ligaments may permit impingement on a posterior nerve root. When this root is traumatized, the patient experiences pain along the distribution of the nerve fibers. A reactive muscle spasm of the sacrospinalis muscle group may be painful and produce scoliosis, which persists until the muscle spasm can be relieved. Intervertebral disks have been shown to bulge intermittently after a partial tear of the posterior portion of the annulus fibrosus. Each such protrusion of the disk may pinch a posterior nerve root against the bone of one of the appendages of the spine, causing pain, muscle spasm and scoliosis. A complete study of this patient from the standpoint of history and physical findings carried out by an orthopedic specialist will probably be required if an accurate diagnosis is to be made or effective treatment is to be prescribed.

MUSCLE ATROPHY AND SCAR FORMATION FOLLOWING COMPOUND FRACTURE

To the Editor:—**A patient has a healed compound fracture of the upper third of the femur. He can straighten the leg on the thigh but can flex it not more than 15 degrees. The quadriceps is greatly shrunken. The probable diagnosis is that the muscles are caught in the healed bone lesion with scar formation near the fractured area. I am considering cutting down on this, and if a cicatrix is found I expect to excise it. What is usually found in such cases and what should be done? If the diagnosis is correct and the scar is excised, will a fascial transplant be required to prevent the occurrence of fixation?**

Coleman G. Buford, M.D., Elizabeth, Ill.

ANSWER.—It seems remarkable that the patient can fully extend the leg on the thigh with an atrophic quadriceps and a possible scar inclusion. Presumably some of the fibers of the quadriceps have escaped damage or adherence. It may be possible in an ischemic field to excise the scar and adherence and close up the muscle fibers. This would not be a guaranty against a readherence to the bone or periosteum and it would be wise to make a fascial transplant of sufficient area, with adherent fat surface to be turned up beneath the repaired muscle, with the fascial surface against the bone. Early active use of the muscle should then be encouraged after wound healing. A most careful hemostasis is required in this procedure to prevent formation of a hematoma.

SANITATION OF HOSPITAL FLOORS—PREVENTION OF FUNGOUS INFECTIONS

To the Editor:—**I should like to know the modern and efficient method in vogue in hospitals for the sanitary care of ward floors, toilets and bathrooms. Is it necessary to mop the floors and wash the toilets in wards where patients are incontinent, urinate and defecate on the floors with such drugs as cresol solution or is soap and water all that is necessary? What is the proper prevention of fungous infections of the feet? Will mopping the floors of the wards and bathrooms with such antiseptics as cresol be a preventive or should a 1 per cent solution of sodium hypochlorite be used before and after bathing?**

M.D., Tennessee.

ANSWER.—As a general policy the use of cresol solutions on bathroom and latrine floors which become soiled by urine and feces is not recommended. Adequate scrubbing with soap and water and thorough flushing with clean water, under pressure when necessary, is sufficient. If desired, the floor may be "freshened" by flooding with a chlorine solution after cleaning with soap and water. For this purpose 1 ounce of calcium hypochlorite (70 per cent available chlorine) or 2 ounces of chlorinated lime (35 per cent available chlorine) in 5 gallons of water allowed to stand ten to fifteen minutes before flushing off with fresh water is adequate.

With regard to the prevention of fungous infections of the feet, the following extract from the *Bulletin of the U. S. Army*

Medical Department, November 1944, is quoted: "Recent studies on the use of hypochlorite solutions for the prophylaxis of 'athlete's foot' have thrown doubt on the effectiveness of this method of control. The consensus is that hypochlorite foot bath solutions are not effective in the prevention of spread of dermatophytosis. Their failure to prevent spread of fungous infections has been attributed to various factors inherent in chlorine solutions. Of chief importance among these factors are the variable rate of decrease in concentration and limitation of range of effective fungicidal concentrations. The former factor is more or less common to all foot bath solutions; the latter is peculiar to chlorine solutions. Limitation of range of effective fungicidal concentration is due to the following features: 1. Hypochlorous acid, the active fungicide, is not formed in effective amounts above p_H 8. 2. Strong solutions of calcium or sodium hypochlorite yielding 1,000 parts per million of free chlorine have a p_H above 8 and are too alkaline to form effective amounts of the active fungicide. While the use of this concentration would be practicable as regards maintenance, it would be ineffective as a fungicide. 3. Although dilution of hypochlorite solution produces greater dissociation, a lower p_H and more of the active fungicide, an effectively low concentration yielding 100 parts per million of free chlorine would require replenishment hourly when used by as few as fifteen men. The use of this concentration is therefore impracticable. It seems probable that any foot bath solution would be ineffective for the following reasons: 1. Even if foot baths killed all the free spores, a certain proportion of spores are encased in the keratin of epidermal scales. 2. Any solution which would dissolve keratin rapidly enough to be effective in killing keratin-encased spores in a foot bath would also dissolve the horny layer of the sole and produce a severe dermatitis. 3. The spores which are keratin encased are tracked on to floors adjacent to foot baths, subsequently become freed from the scales, sporulate and then serve as the main source of reinfection. It is therefore suggested that emphasis be placed on the following mechanical methods of prophylaxis: 1. Flushing of shower room and barracks floors with water under pressure. 2. Scrubbing of floors with brush and detergents. 3. Exposure of flooring or duckboards, when practicable, to direct unfiltered sunlight after application of the methods described in 1 and 2. It is believed that more progress will be made in the reduction of athlete's foot by these means than by the use of foot baths."

ARMY USE OF SALTPETER

To the Editor:—**It has been repeatedly called to my attention that the Army puts certain chemicals in the food, probably some potassium salt, which greatly reduces sexual desire and the number of erections. I have been unable to learn anything definite about this. However, since being a patient here and eating away from home for a few weeks, I find that is definitely the condition in myself. Perhaps this is all psychic, but it has never occurred to me before and there is no physical reason for it now. Is this assumption correct, and if so what preparation is used? Is there such a drug that can be used without permanent harm to the individual?**

Lieutenant (MC), U.S.N.R.

Answer.—Saltpeter is used and has been used for years in curing most meats for both civilian and military use. The amounts used and the reasons for its use by the Army are identical with the use to which it is put in food for civilian consumption. Medicinally the uses of this chemical are identical with those of the best of civilian medical practice. Saltpeter is not used by the Army for its popularly reputed anaphrodisiac action—a reputation not justified by the facts in nontoxic doses.

MALARIA

To the Editor:—**Can the parasites of malaria be detected in a blood smear when the patient is taking atabrine? I have in mind an army officer who has just returned from eighteen months in the Philippine Islands and who has been taking the usual daily army preventive doses. Can malaria be diagnosed and treated without allowing the patient to stop atabrine?**

Robert R. Snook, M.D., Manhattan, Kan.

Answer.—In order to determine whether cure has taken place, it is always necessary to remove the drug. If a patient is taking atabrine constantly it is practically impossible to demonstrate any parasite in the blood smear. In order to establish positive diagnosis, it is necessary to take from the patient all antimalarial drugs. It is probably preferable to remove all suppressive medication and treat the attacks as they occur. This point, however, is not established.

EMBALMING OF BODIES

To the Editor:—**What are the usual components of the common embalming fluids and in what proportion are they used? What quantity of the embalming fluid is used? Is it necessary to use two or more kinds of embalming fluid? Are there any good books on embalming? Those by Charles A. Renuard and C. F. Callaway do not mention the composition of the embalming fluids. Who performs the embalming work in the United States? Is it well considered and ethical in the United States for physicians to do this type of work?**

M.D., Cuba.

Answer.—The composition of modern embalming fluids varies greatly. Most of these fluids are dispensed in a concentrated form and the manufacturer furnishes directions for dilution. The formulas are trade secrets. The main purpose of an embalming fluid is to preserve and disinfect the tissues; hence the diluted fluid injected into the body must have sufficient strength to be a disinfectant. The basis of most embalming fluids is solution of formaldehyde, ethyl alcohol, glycerin and certain inorganic salts. Approximately a 5 per cent concentration of the first three ingredients makes a suitable fluid, although many other factors must be considered: Solution of formaldehyde disinfects and preserves. It hardens the tissues and contracts the capillaries but lacks penetrating power; hence it alone is not a good fluid for embalming. To overcome the hardening action of formaldehyde, glycerin is added; this renders the tissues soft and pliable and allows the capillaries to expand on injection. The penetrating power is increased by the addition of ethyl alcohol, which enables the formaldehyde solution to penetrate much farther into the tissues than if injected alone. These three substances, formaldehyde, alcohol and glycerin, are sufficient for preserving and disinfecting. However, their combination and use have many difficulties; for this reason most manufacturers have added other materials to aid the disinfection and preservation of the general appearance of the body. In recent years certain organic compounds known as glycols have been employed as substituents for glycerin and alcohol. These compounds are good penetrating agents and many of them have antiseptic properties.

For proper drainage and good embalming, a fluid must contain certain inorganic salts to give the final diluted embalming fluid an osmotic pressure corresponding to that of the blood. Such a solution will prevent hemolysis of the red blood corpuscles, thus preventing further staining of the tissue. It will also assist in the removal of blood pigments and other blood residues. For this reason inorganic salts, especially sodium chloride, are added to embalming fluids. Many chemical materials may be used in embalming fluids in addition to the ones mentioned. Saltpeter, benzoic acid, sodium benzoate, salicylic acid, sodium salicylate, borax and many other compounds are used.

The quantity of the embalming fluid varies and depends on the blood removed for the natural lifelike appearance of the individual. The cause of death, duration of the illness, pathologic conditions, medicines administered, condition of the tissues as to moisture content, climatic conditions and the interval between death and embalming play an important part as to the quantity of fluid used. An average of 2 to 3 gallons of diluted embalming fluid is used for the average case.

In modern embalming two types of embalming fluids are used, one for the arterial work as described and one for the treatment of the visceral organs. The cavity fluid differs from the arterial fluid in that it contains a greater concentration of formaldehyde. In the average body 16 ounces of the cavity fluid is used as a direct injection by means of a trocar into the visceral organs. Hollow visceral organs are aspirated before cavity fluid is injected. The arterial fluid may be used for the injection of the visceral organs, but this is not recommended.

Apparently embalming textbooks do not give the composition of embalming fluids. The following textbooks may be obtained relative to this subject:

Outline of Chemistry, R. P. MacFate, Ph.D., Worsham College of Mortuary Science.
Principles of Embalming, R. G. Reichle, B.S., Worsham College of Mortuary Science.
Chemistry of Embalming Fluids, Simon Mendelsohn, Cincinnati.

In the United States embalming is done by licensed embalmers. Each state requires, by statute, certain qualifications before an applicant is eligible to receive an embalmer's license. In the United States if a physician wished to practice embalming and funeral directing it is necessary to fulfil such requirements before being permitted by law to do so. The law, however, does not apply to the preparation of anatomic material for use in medical colleges.